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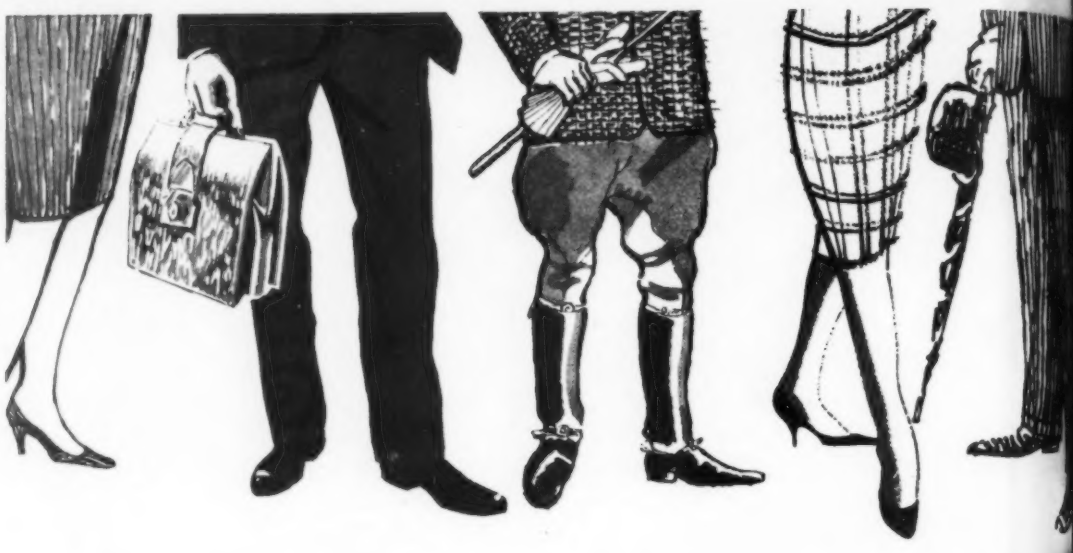

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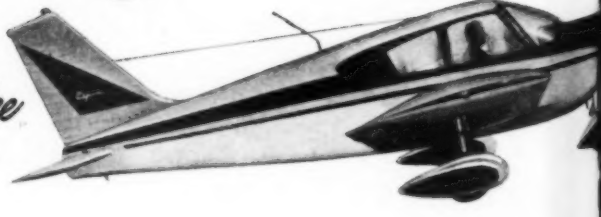

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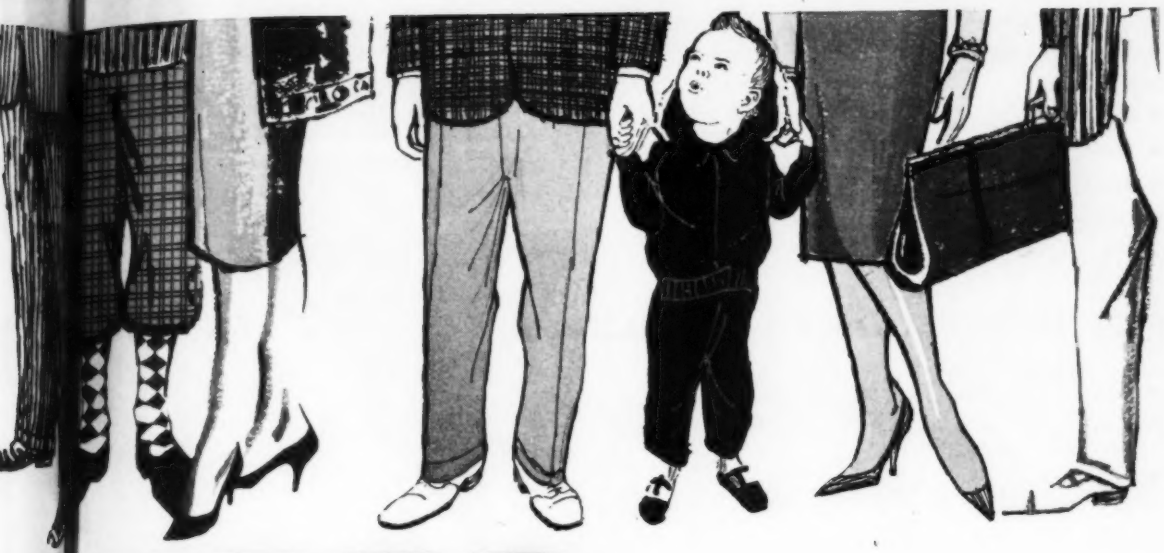

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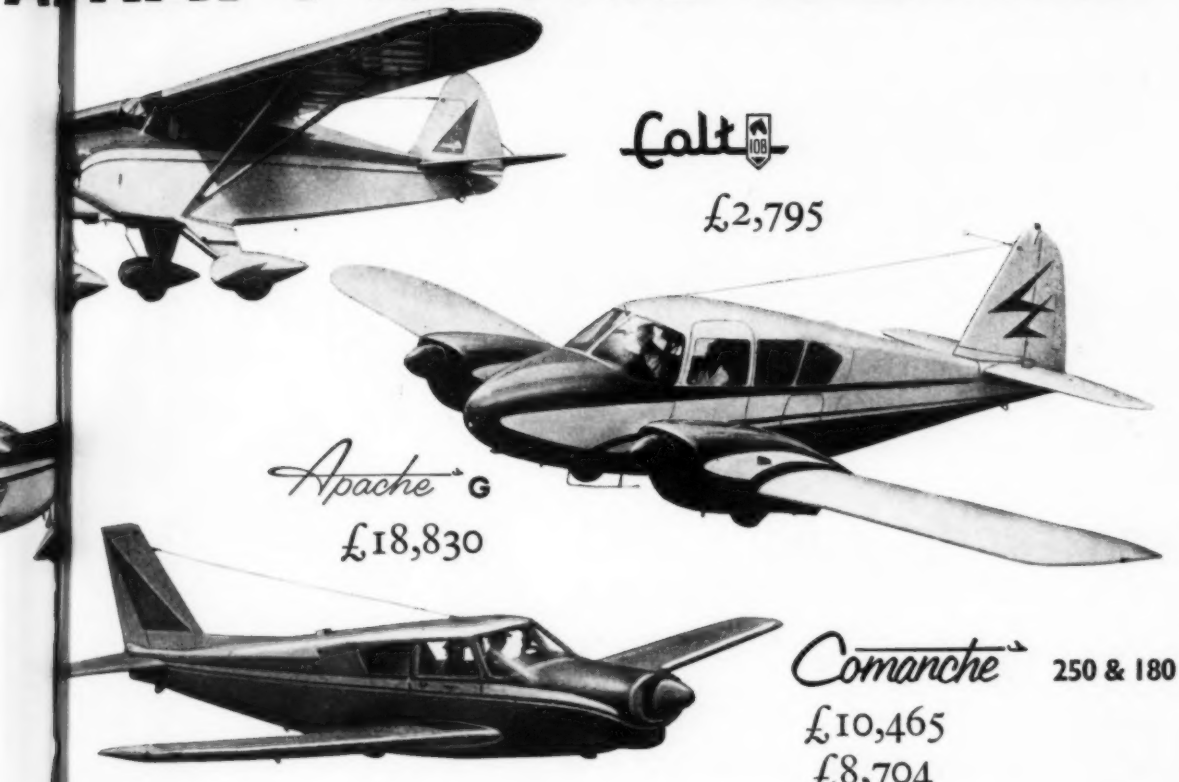

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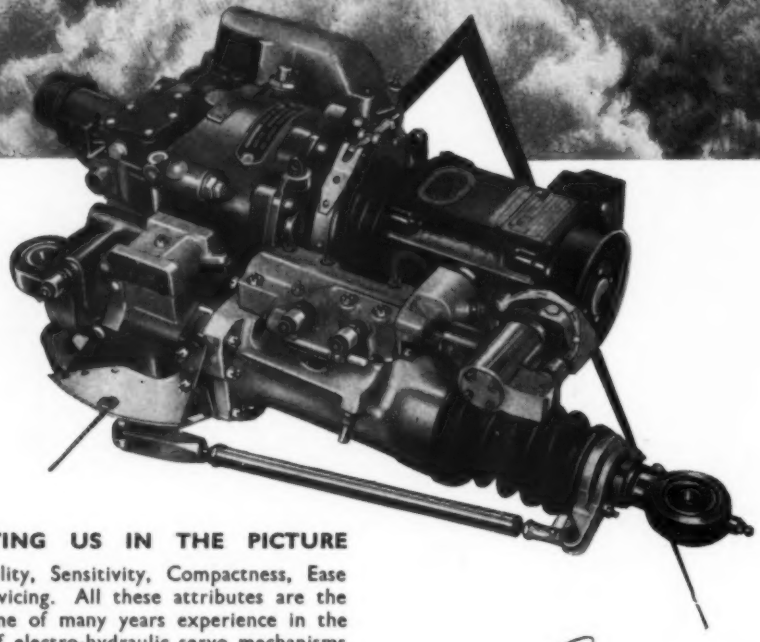

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Vickers Vanguard taking passengers aboard at London Airport (Heathrow)

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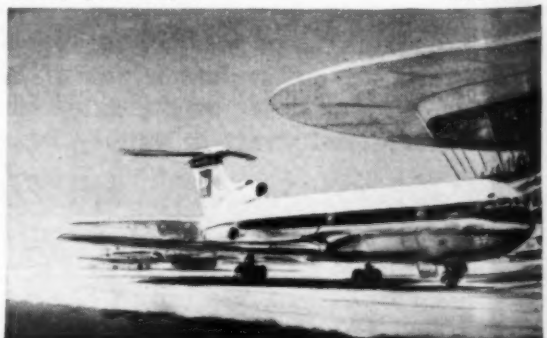

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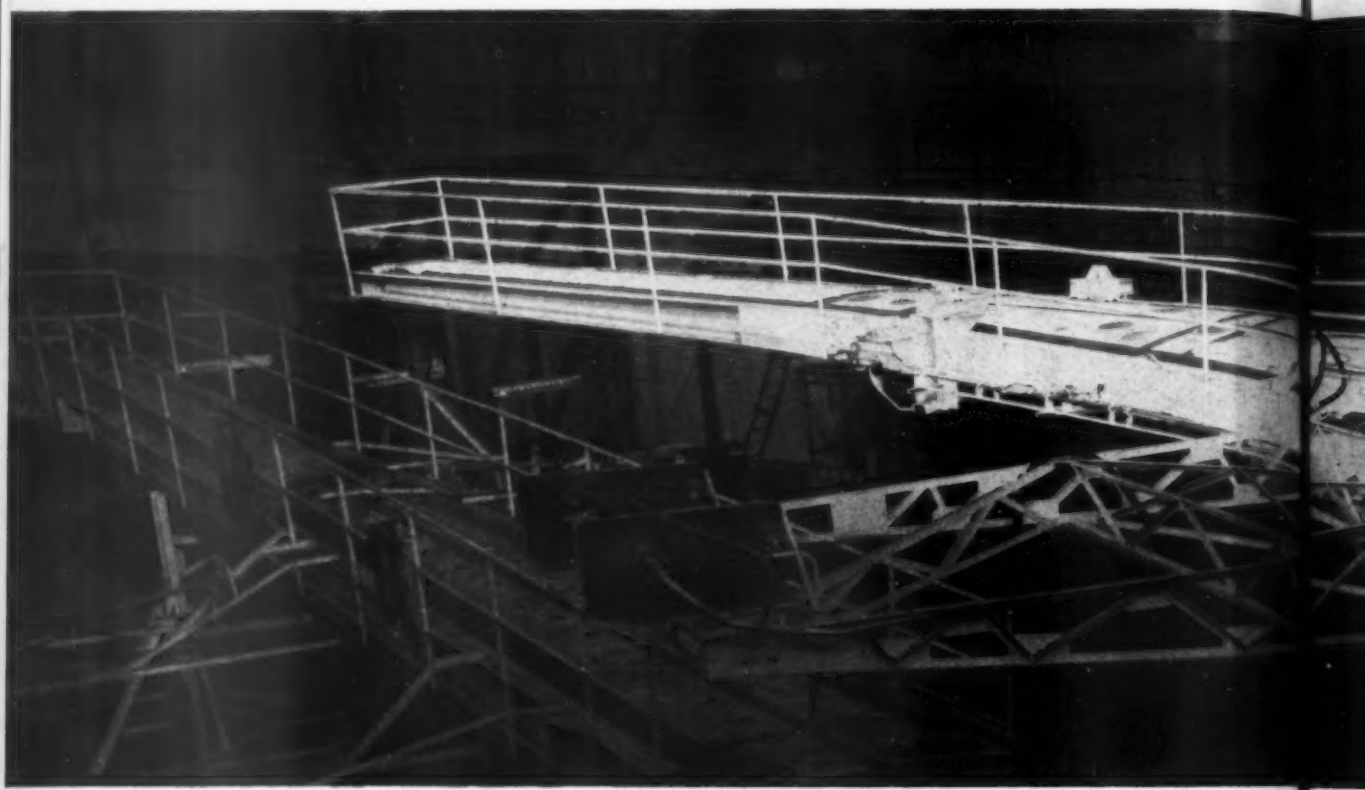

This is one of seven indicators in the VC.10 fuel load control panel which enable any desired weight of fuel to be selected for the tank concerned. These gauges automatically control fuel load in their respective tanks to pre-set quantities.

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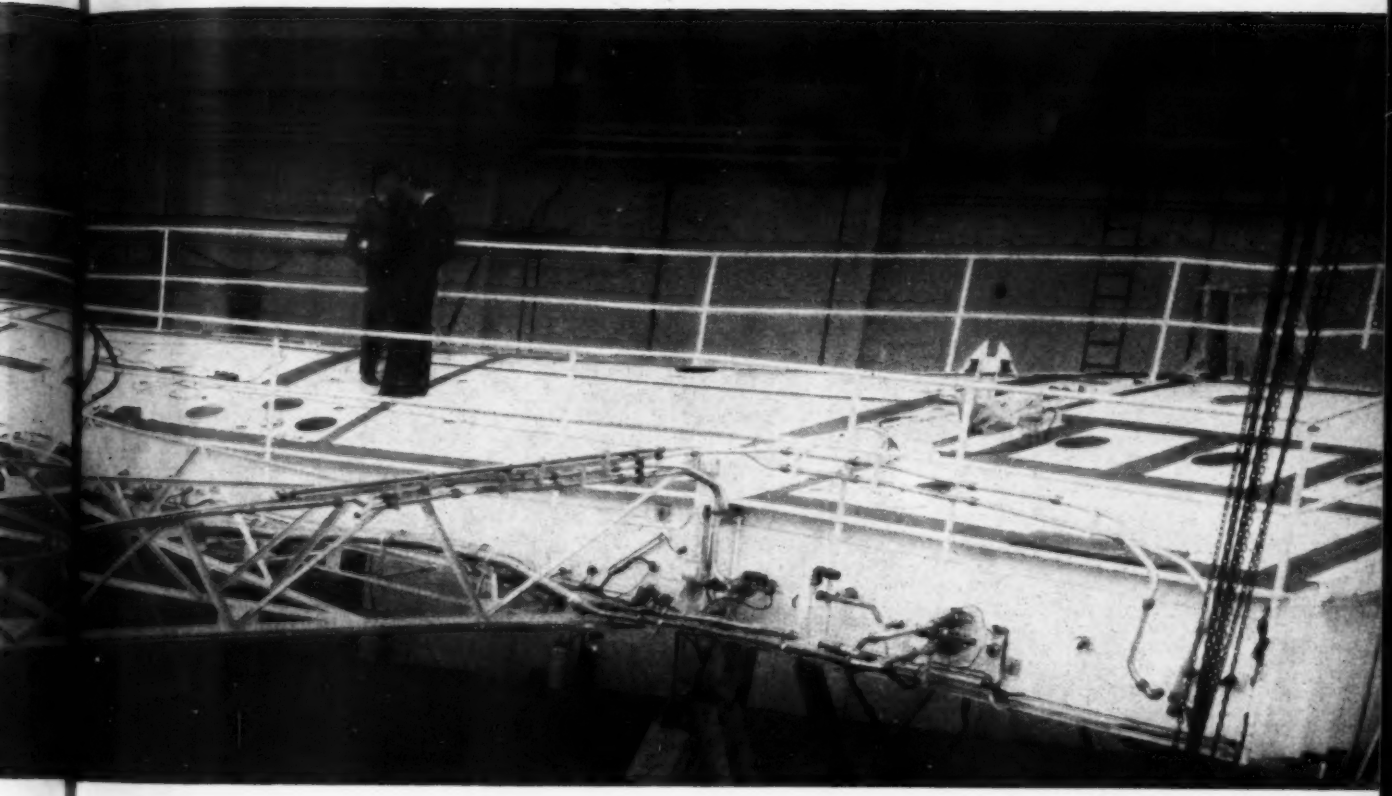

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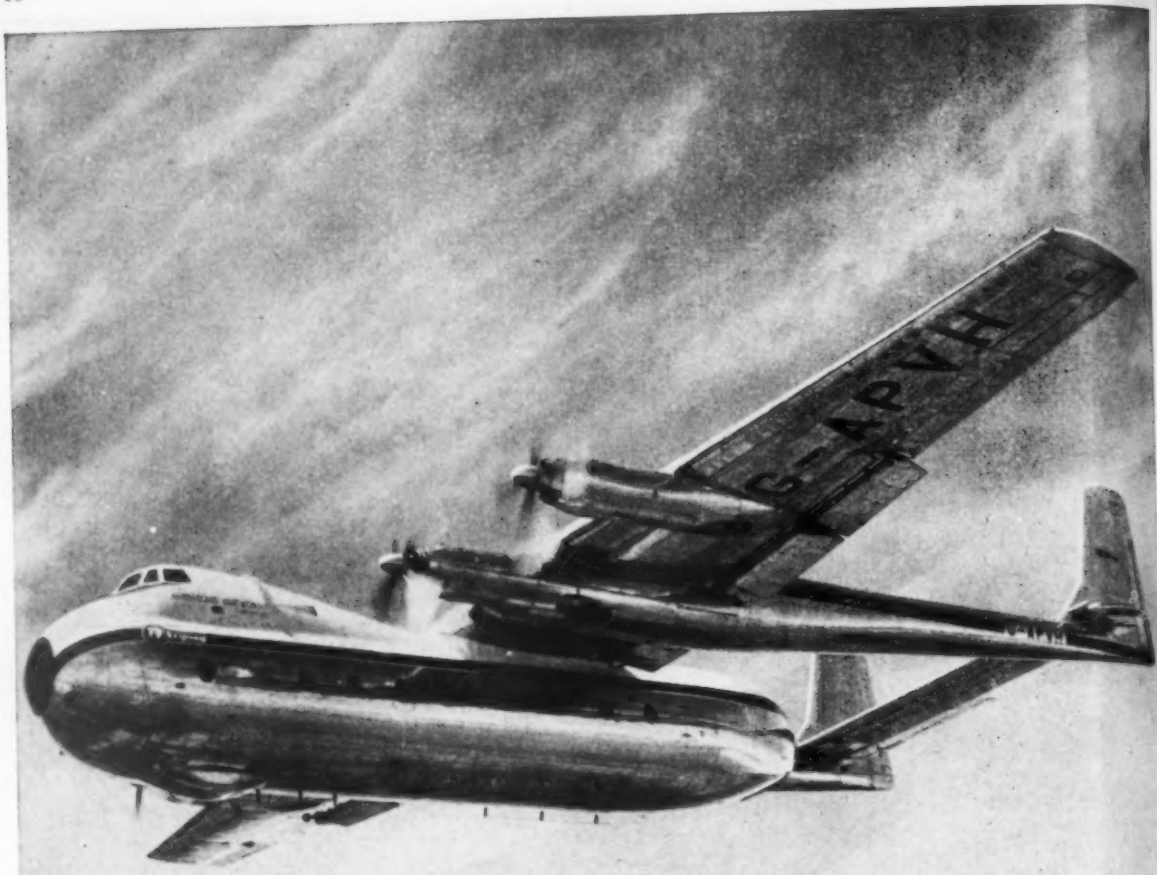

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No 2715 VOLUME 79 THURSDAY 23 MARCH 1961

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Full Cry

THERE is a zest of spring about this special "Private and Executive Flying" issue. The Beagles, as Mr Peter Masefield gives assurance on page 380, will soon be in cry; and pages 368 to 374—cataloguing no fewer than 50 types of aircraft now available in Britain "off the shelf"—are evidence that they will not be the only pack on the scent. Moreover, people out for business or recreation will soon be taking a second look at rotating wings. These may be engine-driven, as on the Cessna Skyhook, obtainable through Airwork; or they may autorotate, as on the Umbaugh 18, a concession for which has been granted to Holman & Co, of Glasgow.

Yet the British packs would be utterly swamped in the vast agglomeration of private and executive aircraft now afield in the USA. The US journal *Aviation Week* believes that more than two hundred million dollars' worth of business in retail sales of aircraft and parts will be done this year. Yet no records in unit-sales or dollar-volume are expected. In fact, our contemporary comments that with America's national outlook uncertain over the next few months it becomes difficult to estimate what the business-flying sales scoreboard will look like at the year's end. American industrial spokesmen believe that if sales come close to those for 1960 then business flying will have proved its stability, just as it did in America's 1958 recession, when it actually showed a gain over 1957 in both dollar-volume and units delivered.

It is disagreeable to have to consider the possibility of recession in our own country as well as in America. Yet that possibility is there unless our exports are stepped up. And in this regard it is cheering to learn that Mr Masefield expects 70 per cent of Beagle's business to be done overseas. He believes that we have the advantage of starting with a clean sheet of paper, whereas competitive types in America and France are mostly old-established aeroplanes which go back in their conception to around the middle 1940s.

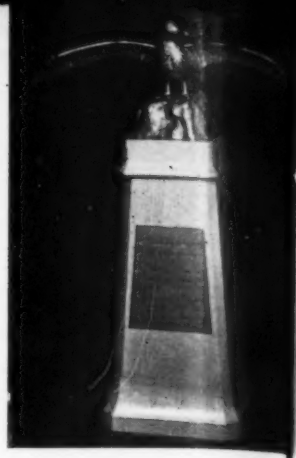
Association of Ideas

These thoughts are greatly encouraging, and we in Britain are further encouraged in the knowledge that 300 firms have already declared their intention of joining the Business Aircraft Users Association (page 375), although that enterprising body is still in its early formative stages. Beagle's managing director believes that two years hence the number will have increased tenfold. We hope that the Association will find this issue to be a serviceable implement for propagating their cause. Above all it is an "ideas" issue—for prospective business users and for executive and club pilots; and for ideas about making private flying safer—ones that are already in practice—*Flight* has been looking in recent weeks to France and the USA. One such scheme, from America, is the "180° rating," a bad-weather avoidance technique that sensibly recognizes the limitations of amateur pilots. Its application to the British scene is discussed on page 367.

Certainly the compilation of this issue has given us more pleasure than is afforded by its companion number that treats of guided missiles. And we have found in its preparation the same satisfaction as we always derive from the "special" devoted to the world's airliners. For, as our new contributor "P.P.O." affirmed last week, private pilots do not want to interfere with the airliners and the professionals. They want only to share the air with them.

Finally, to the Standing Joint Committee on Private and Club Flying, whose useful work is described for the first time on page 365, we would address one plea—that the public should be better informed on the Committee's activities.

FROM ALL QUARTERS



GLIDING INSTRUCTION is to be the theme on which the award of the Robert Perfect Memorial Trophy is to be based. Presented to the British Gliding Association by the Air League, the trophy will go to the club with the greatest number of instructors in proportion to membership. The bird depicted is the albatross

Big Contracts for Scottish Aviation

THREE big contracts, together worth "several million pounds," were announced last week by Scottish Aviation Ltd. One—to a value of about £1m—is for ten Series 3 Twin Pioneers for the Government of the Mali Federation in West Africa; another provides for the Prestwick company to take over a large proportion of Merlin and Griffon overhaul work from Rolls-Royce; and the third—details of which have yet to be finalized—is for an extension of existing P & W overhaul work.

The Series 3 Twin Pioneer is the version with 615/640 h.p. long-stroke Alvis engines. Mali Federation already has five Pioneers and four Twins; and the latter are to be returned to Prestwick for conversion to Series 3 configuration.

Yet another contract in prospect, though not signed at the time of writing, is for a renewal of the company's Orenda 14 engine overhaul work for the RCAF, which has been at the rate of over 200 engines annually.

Recent redundancy has reduced Scottish Aviation's labour force to about 1,800; but now Mr T. D. M. Robertson, the managing director, has expressed the hope that the new contracts may result in a return to the earlier level of 2,200.

Gnome-Whirlwinds for Ghana

SIX Series 3 Westland Whirlwinds have been ordered by the Ghana Government for service with its air force. Powered by the de Havilland Gnome H.1000 free-turbine engine, the Series 3 is a civil version of the Whirlwind HAR.10 now in production for the RAF. One of the Ghana aircraft will have a six-seat luxury interior for use by senior members of the government; the others will be readily adaptable for communications, ambulance or rescue duties. All six will be fully instrumented for all-weather day or night flying.

Value of the order, which includes spares, is over £550,000; deliveries are to begin in the autumn.

A STOL Herald

THREE lectures given to the Reading and district branch of the RAeS on March 15 dealt with the development of the Handley Page Dart Herald. They had been prepared by Handley Page executives —J. Allan, chief designer; F. Farrington, chief technician; and R. J. Davies, chief aerodynamicist. Spectacular performances mentioned by Mr Allan included a single-engined take-off from an airstrip at 11,000ft in a Himalayan bowl—believed to be the highest ever undertaken by a twin-engined aircraft. In the absence of Mr Davies, now on a sales tour of the Caribbean, the chief designer read the paper on flight-test development, mentioning that the programme had now led to a full C of A. An indication of the high design standard achieved, he said, was that, in the unlikely event of a generator failure, the Herald could continue to fly for 90min with all essential electrical services. Mr Farrington said that tests by Handley Page and the RAE had established an indefinitely long fatigue-free life for wing and fuselage.

Mr Allan later spoke of projected civil and military developments, including a rear-loading military Herald for close-support operations and having STOL performance. From a standstill it could climb to 50ft in only 350yd. Mention was also made of the HPR.8 short-range high-density ferry aircraft carrying 100 people or six cars.

SC.1 Flown From Unprepared Concrete

ON March 13, Short Brothers & Harland Ltd and Rolls-Royce Ltd jointly announced that, during recent tests at the RAE Bedford, the SC.1 VTOL research aircraft had operated from unprepared concrete surfaces. Previously this had never been attempted, partly owing to the fear of causing severe damage to the surface but chiefly because re-ingestion of the exhaust gas from the four lift engines would have resulted in a substantial drop in thrust, probably at a critical period. To overcome the latter hazard, Short & Harland and the MoA have co-operated in studying several types of operating platform, finishing up with a metal floor raised about 12in from the ground and provided with a grille directly beneath the aircraft through which the lift-jet gas passes, finally escaping round the edge of the platform well away from the aircraft.

Tests at Bedford have now shown that take-off from plain concrete results in no deterioration in handling qualities or performance, and no erosion except in a very localized area. Further research is still needed before protracted ground-running of the lift engines becomes possible without a special platform; Short & Harland say that "a simple ground scoop which will disperse the exhaust gases" is being developed. Both SC.1s, XG900 and XG905, have now completed more than 40 complete transitions, flown since the retirement of Tom Brooke-Smith by Mr Denis Tayler, MoS, and Mr Alec Roberts, of Shorts. The first SC.1 is about to be handed over to the MoA, while XG905 goes back to Belfast for the installation of new equipment.

Lockheed Jet Freighter

AFTER behind-the-scenes manœuvres lasting well over a year, Lockheed Aircraft have finally won the competition to supply an "optimized" jet freighter to the US Military Air Transport Service. Notwithstanding the imminence of well-developed jet freighters by Boeing, Convair and Douglas, Lockheed's Georgia Division were on March 13 awarded a contract for 100 aircraft to meet Specific Operational Requirement 182 (Support System 476L), at a cost, including development charges and support facilities, of approximately $1,000m.

Lockheed have been very fortunate in securing very wide acceptance of their family of C-130 Hercules cargo aircraft. Current versions, powered by Allison T56 turboprops, are used by the US Air Force, Navy, Marine Corps and Coast Guards, and by the air forces of Canada and Indonesia. Late last year 50 of the advanced C-130E version were bought as interim aircraft for MATS, and last month it was revealed that British Aircraft Corporation may possibly build the blown-flap version in England. The only setback came when USAF support for the Allison T61, the engine for the GL-207 "Super Hercules," was withdrawn late in 1959. Lockheed flirted briefly with the Rolls-Royce Tyne, and then started a major redesign to accommodate turbofan engines.

At least six basic variants have been discussed with military and civil customers. As long ago as last May an artist's impression was released showing the GL-207-42, and brief performance figures sufficed to show that with four advanced Pratt & Whitney JT3D-11 engines it would be superior to any direct cargo conversion of the current "big jets"; moreover, it would have a floor at truck-bed height. Essentially this is the machine now ordered. As noted in an article on Northrop boundary-layer control in *Flight* for December 16 last, the specified gross weight of 235,000lb imposes sharp restrictions on payload/range, and the SOR-182 design points fall inside what can be accomplished by a contemporary "turbulent" aeroplane. Were laminarization adopted, the range with 60,000lb payload would be raised from 3,000 to approximately 5,000 n.m.,

RECALLING the London - Rome and London - Malta flights by Belvedere XG542, the crew—Gp Capt (then Wg Cdr) C. B. Brown, Flt Lt G. W. Smith, and Master Engineer A. E. Risby—were presented with inscribed cigarette boxes. Left to right: Flt Lt Smith, Capt H. Traill (Westland service manager), Gp Capt Brown, Mr Raoul Hafner (technical director—research, Westland), M/Eng Risby, Mr Roy Bradley (assistant chief test pilot, Westland), and Mr A. W. Gregg (public relations manager, Westland)

PREVIEW of the Hampshire Aeroplane Club's Halcyon twin is given in this first photograph of the type. It is powered by two Walter Minors. A progress report appears on page 381

and with 20,000lb from 5,500 to about 9,400 n.m. But Lockheed have said nothing about such drag-reduction, and may not even adopt blown-flaps. Maximum payload will be 77,000lb, and cruising speed 440 to 500kt.

Georgia Division are due to fly the first machine—the military designation has yet to be divulged—by mid-1964, and to deliver in 1965. In *Flight* of June 10 last we commented that Lockheed claimed a 32-month lead-time on a commercial version, so that the latter should be available at about the same time as the civil variant of the Short Belfast. The P & W JT3D-11 is rated at 22,000lb wet, and is a new engine. Little of the basic C-130 can be retained in the new freighter, and the wings and tail are swept. Hold cross-section will be 10ft wide by 9ft high, comparing with 11ft 8in by 8ft 9in for the AW.660 and 16ft 1in by 13ft 9in for the SC.5 Belfast. The eventual number bought will certainly exceed 100, and the actual selling price per aircraft will be around $5m.

"Little Farnborough" at Luton

STYLED "First International Aircraft Exhibition and Convention, London," a new British aircraft show will take place at Luton Airport between August 29 and September 2. Principal exhibits will be light and executive aircraft and associated equipment. An open area of about 10 acres will contain display sites, each with its own tent or caravan. For the first four days admission will be confined to Government representatives, business executives and guests.

Ryan's Flex Wing

IT was announced on March 8 that the US Army Transportation Research Command have awarded the Aerospace Division of Ryan Aeronautical Co a contract for the flight testing of a powered test vehicle for the Flex Wing. Based on studies pioneered by Francis M. Rogallow of NASA's Langley Research Center, the Flex Wing consists of a triangular membrane attached to sharply swept leading edges and a central keel, each of which may be rigid or inflatable. The complete assembly can be folded into a small package, yet deployed faster than a parachute, when it assumes the form of a pair of conical surfaces side-by-side, flying point-first—like a paper dart.

Ryan are so encouraged by their research that the concept appears likely to have wide applications. Configurations have been tested, both in free flight and in tunnels, from sea level to 200,000ft and from low speeds up to M4.9. Immediate applications include the lifting of utility aircraft, manned or unmanned payload carriers, tower gliders and emergency wings for V/STOL vehicles. Indicative of the work being done is the free-flight testing of an unusually manoeuvrable radio-controlled 5ft model with a 1.5 h.p. engine, the fact that a Boeing-Vertol H-21 helicopter can tow an 18,000lb load supported by a Flex Wing without reduction in speed, and that Ryan have received a NASA study contract for Flex-Wing recovery of the first stage of the Saturn booster.

Money for Manpowered Flight

THE Manpowered Aircraft Group Committee of the Royal Aeronautical Society has announced two awards, up to a maximum of £1,500 each, to enable designs for manpowered aircraft to be developed. One goes to a group at the Department of Aeronautics and Astronautics of Southampton University (Miss A. J. Marsden, Mr A. Lassiere, and Mr D. J. M. Williams), and the second to the Hatfield Manpowered Aircraft Club, of which the chairman is Mr J. C. Wimpenny and the secretary Mr E. C. Clear Hill.

The committee has considered a number of projects, some of which are still in very early design-stages. In addition to the two above-mentioned schemes, the designs of four other groups who have applied for assistance are currently under discussion. These applicants are: a group at Aviation Traders Ltd, Southend (Messrs B. C. Basu, A. P. Drescher, M. H. Jung, B. A. Kerry and M. D. Prentice); Mr P. M. Savage of Imperial College; Mr I. D. Lawrie and Mr F. Bridges of the Vickers-Armstrongs Apprentices Association, Weybridge; and Mr C. Hodgess-Roper, of South Woodford.

Contributions from individuals and firms have increased the Manpowered Aircraft Group's fund for assisting such designs to almost £5,000. The committee to the group has collected information about wind tunnels which might be made available for tests, and other offers of help have been received.

BOAC Avons' 2,600hr Overhaul Life

ARB approval has now been received authorizing a 2,600hr overhaul life for the Rolls-Royce Avon RA.29 Mk 524B engines powering the BOAC Comet fleet. Each engine will thus fly over a million miles in service between overhauls. Coupled with this record achievement is the fact that the total maintenance work, including scheduled and unscheduled engine removals and re-installation, is under four man-minutes per engine hour.

This latest increase in overhaul life, from 2,300 to 2,600hr, continues the rapid build-up maintained by the Avon RA.29 since it entered service in October 1958. From this high introductory life of 1,000hr, it has progressed in 200hr and 300hr steps to its present figure, and selected engines are already proceeding to 2,900hr. These are true overhaul-life rates and do not involve any scheduled part-life inspections or components changes. BOAC Avons are increasing their total running time, currently standing at more than 439,000hr, at a rate of some 5,000hr a week. Total running time of all Avons, civil and military, is well over 3½ million hr.

IN BRIEF

The East German aircraft industry is to cease all work on aircraft and will convert to general engineering.

The Folland Germ ground-effect vehicle has been demonstrated to Lt-Gen Sir Michael West, GOC Northern Command.

An agreement between Breguet and Lockheed Aircraft Service provides for co-operation in France for maintenance work involving military equipment for NATO and the USAF.

Britain's January aviation exports figures, £12.85m, was £1m more than the monthly average achieved last year. Of this total, aero-engine sales came to a record £7.5m.

It was reported from Moscow last week that a geologist flying in an Mi-4 helicopter opened the door to throw out a cigarette end—and went with it. He fell 1,050ft and landed, unhurt, in a deep snowdrift.

At the request of Soc Turboméca, SFERMA have installed an Astazou turboprop in a Do-27. The converted aircraft flew on March 2, from Bordeaux-Mérignac, in the hands of Henri Alligier.

Stanley Aviation's escape capsule for the Convair B-58 will be tested in a live ejection "some time this summer," from a B-58 flying at over 850 m.p.h. over Edwards AFB. This fastest-ever controlled ejection will be preceded by tests with dummies.

The Worshipful Company of Carmen, one of London's ancient City livery companies, has awarded its 1960 Viva Shield—for the year's most outstanding transport improvement—to Mr Christopher Cockerell, inventor of the Hovercraft.

Due to be read at the Royal Aeronautical Society, London, tonight is the fourteenth Louis Blériot lecture, *Problems of Short Take-off and Landing*. The paper is being given by Gen Ziegler, general manager of SA Louis Breguet.

Lockheed's Georgia Division announced on March 2 that the tooling for the North American B-70 Valkyrie upper intermediate fuselage is rapidly moving into the hardware stage, and is on schedule to permit the first flight of the first aircraft to take place late in 1962. This suggests that the B-70's recent year in the doldrums has not affected the first-flight date.

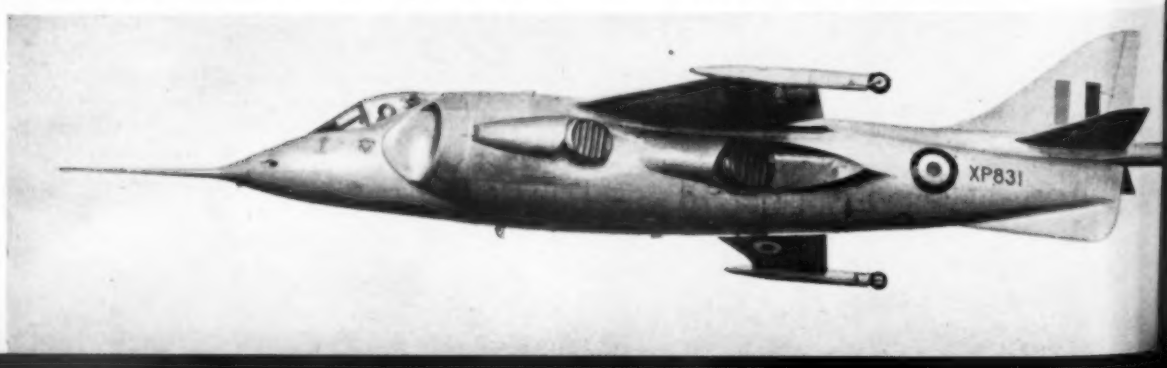
Mr R. S. Easby, DFC, AFRAeS, who has been sales manager (fixed-wing aircraft) of Bristol Aircraft Ltd since November 1958, will on May 1 join Sino-British (Hong Kong) Ltd as director in charge of their Tokyo branch and assistant director to the chairman, Mr John B. Macmillan. Sino-British are engineers, exporters and importers, and hold the Far East agency for a number of major British aviation concerns.

A special exhibition of metallic corrosion and preventive methods is to be held at the Science Museum, South Kensington, from noon on Monday, March 27 to 6 p.m. on Saturday, April 22. Assembled by the Corrosion Group of the Society of Chemical Industry, it will mark the First International Congress on Metallic Corrosion, to be held in London from April 10 to 14 under the presidency of Sir Harry Melville.

All three Services, the Royal Navy, Army and RAF, are participating in this year's Paris Show (May 26 to June 4). RN Scimitars are putting on an aerobatic display; there is to be a Thunderbird battery from 36 (GW) Regt, RA, and a team to man a Blue Water missile; and part of the RAF participation will be air drill by Lightnings of No 74 Sqn and a Jet Provost aerobatic team of the Central Flying School.

P.1127

Photographed in forward flight for the first time (see opposite), the Hawker P.1127 looks a pugnacious combat aeroplane, in sharp contrast to many preceding VTOL devices. Britain and Germany have announced their intention of jointly developing from the present P.1127 a tactical strike machine suitable for NATO, who have an announced requirement for such an aircraft



RETREAT FROM GUIDED WEAPONS

By B. A. Hunn

THE other day I was clearing out my cupboards in preparation for my departure from the guided-weapons industry, I came across a draft of an article entitled: "Reflections of a Weaponeer" which *Flight* published over four years ago. I sat down to read it to see if my ideas have changed much since then. It saddened me to find that, although I agreed with many of the ideas, practically none of the aspirations of the g.w. industry have since been realized. For this reason it occurred to me that readers might be interested in a few further observations.

The Prime Minister once said, in effect, " If one stops to reckon up our resources, the only things we have to export are ideas." The armament industry has largely been a source of these ideas, because it has generally devoted its efforts to weapon development since the war, and the ideas have slowly filtered back to industry at large to provide some of our export potential.

By contrast, civil industry has devoted much of its efforts to producing goods more cheaply and cutting down overheads whilst getting new ideas on the cheap from the military. The average of expenditure on research throughout all British industry amounts, I believe, to 1.8 per cent of all profits. By comparison, the taxpayer must have contributed several hundreds of millions to military projects in the last three or four years, with very little to show for it. The danger is that this cheap source of development is gradually drying up.

As peace becomes a less uncertain quantity the taxpayer gets more reluctant to spend money on armaments. To appreciate the truth of this one has only to compare the weapons-industry's present difficulties in getting money from the Government with the lavish situation six years ago.

The economic problem is not, however, confined to armaments. If we examine the three "national prestige" industries, i.e., atomic energy, aircraft and guided weapons, a very similar pattern emerges. Because the nuclear-power programme has been reduced, the companies that rashly allowed themselves to be seduced by Government promise are now entering a phase of redundancy. Again, how often has one read recently that the aircraft industry, currently employing 280,000, has only enough work to support 165,000? As for guided weapons, several companies have died, some are in the last throes, whilst a few, having been artificially fertilized by cost-plus contracts and grown to elephantine proportions, are faced with the horrid prospect of having to reorganize on sound commercial lines should a change in defence policy deny them their sustenance. It may be sheer coincidence, but I feel one ought to be able to draw from these examples some grim conclusions about Government interference in industry.

To meet the needs of our modern technocracy a wise Government has encouraged the universities and technological institutes to absorb to bursting point vast numbers of science and engineering students. The papers advertise for graduates daily and the unsuspecting student views the future through rose-coloured spectacles. But where and how will he be employed? Assuming that this trend away from armament development continues, in what way can the Government replace this source of ideas? There is no single, simple answer. One possibility is that industry should be encouraged by tax relief or subsidy to do its own research and development. Some monetary assistance would obviously be needed in order to avoid passing the cost on to the customer. An alternative would be for the Government to invest in a space programme embracing a large number of companies. Obviously, there are serious objections to both these courses.

What impressions remain? I suppose the clearest concerns the perennial battle against Parkinson's Law. The temptation to establish specialist departments for everything under the sun is not confined to the g.w. industry. I have seen reliability engineers, environmental test engineers, quality control engineers, production engineers, project engineers—not to mention electrical, electronic, mechanical, structural, hydraulic, pneumatic, aerodynamic and even thermodynamic engineers—come and go. And, when you boil it all down, non-specialists with a sound general education and a good "first" in mathematics or physics (coupled with three or four years of varied experience in, say, almost any of the research establishments of the late MoS) could cope with enough of jobs to serve the needs of industry.

The force of this argument has been brought home to me by the pressure of economy on my own department. A guided weapon has been successfully developed with private money by a handful of people in half the time most Government projects have taken—projects that in some cases have each employed ten times as many people. Needs must when the Devil drives!

To convey another impression one might quote Cornford's definition of propaganda, published in 1902. Roughly, he said, "Propaganda is that art of lying which very nearly convinces your friends but your enemies not at all." I would replace "propaganda" by "security" and "convinces" by "bankrupts," for whereas most competent engineers in the industry can rapidly assess what is technically feasible, what really interests us is what the enemy is spending his money on. By contrast, there is a tendency to withhold from civil industry information on technique whilst publicly announcing the contents of Britain's armoury. This puts our industry at a disadvantage with that of the Americans, who appear quite willing to commercialize much of their military development —and rightly so.

On the brighter side I may add that, while there have been occasional twinges of conscience, I have thoroughly enjoyed my g.w. experience. In no other industry can one find so many diverse techniques coming together in any one project and, therefore, have opportunities for learning so much that is new. Nowhere else are there such opportunities for letting the imagination roam freely, try new ideas and feel so creative. However, there are frustrations which, for some, outweigh the pleasures. Most engineers at some time or another would like to feel that they could intimately associate themselves with something that has come off the production line; but in g.w. work such opportunities are few.

As I said once before, what of the future? I can see three minor revolutions taking place in industry at large—revolutions in thinking as much as in anything else. Once upon a time most top executives regarded themselves as a privileged class for whom no qualification other than ruthlessness was necessary. Slowly and irrevocably they are being replaced by qualified and dedicated men who see themselves serving rather than ruling. Secondly, during one era of our industrial progress firms set themselves up to produce what others had designed. They lived for years on these designs, proudly announcing that they had been established in Victoria's reign; and those who did business with them "paid for the name." Nowadays such a thing would seem ridiculous. Finally, one used to think of the really sound engineer as being a man dressed in a blue serge (somewhat shiny) suit, a bowler hat and wearing a gold watch-chain; the sort of man who said "There is only one way to do so-and-so," or "What was good enough for my grandfather is good enough for me." Where we once would have attributed this to experience, we mostly recognise it now as prejudice.

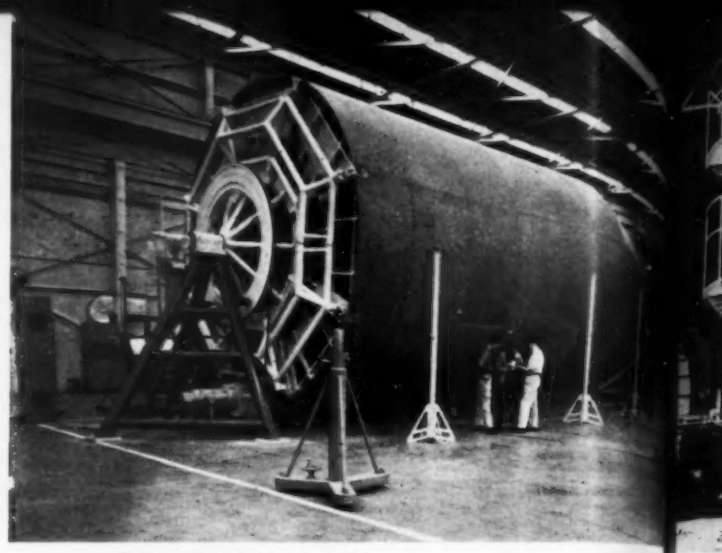
These revolutions are taking place; and, having observed the great competence of many of our native Britons, I feel confident in the future—confident provided that government (irrespective of party) and industry can be persuaded to pursue a long-term policy which taps these considerable natural resources to the full.

THE VTOL 1127 USES A RUNWAY

AS intimated in *Flight* last week, flight trials of the Hawker P.1127 as an ordinary aeroplane have begun from the runway of the RAE, Bedford. The company's chief test pilot, A. W. "Bill" Bedford, took off just after 4 p.m. on March 13 for a 22min shakedown sortie; and he flew again the following day, when these air-to-air pictures were secured. Thus Sir Sydney Camm's VTOL strike fighter continues to surmount its development hurdles in a most encouraging manner.

Powered by a single Bristol Siddeley BS.53 lift/thrust turbofan, it completed tethered and free hovering trials at Dunsfold in about a month last year, and is now well into its free-flight programme. On the first flight the propulsive nozzles were kept facing rearwards at all times, but when basic handling has been investigated the nozzles will be rotated to produce increasing increments of lift until jet thrust is sufficient to support the aircraft without assistance from the wing. For the earliest hovering trials the thrust available was marginal, so that—even allowing for the low ambient temperature—weight was reduced by removing non-essential equipment, and such superficial items as undercarriage fairings. The latter, at least, are now on again. The aircraft has also been painted a pale glossy grey, and given RAF roundels and the serial number XP831. The second 1127 is fast approaching completion.

Missiles and Spaceflight



Assembly of the first dummy Saturn S-4 second stage at the George C. Marshall Space Flight Center, prior to mating into the first flight configuration of the complete three-stage C-1 vehicle. Live S-4s for later flights, designed and manufactured by Douglas Aircraft, will each have four 17,500lb Pratt and Whitney LR119 engines

QUESTIONS IN THE HOUSE

In the House of Commons on March 13, the Minister of Aviation said in reply to a question by Mr John Strachey that there was no conflict between British co-operation with European Governments and co-operation with the United States in space research. Mr Strachey had enquired whether co-operation with the USA in the provision of launch vehicles for a joint space programme (either in addition or as an alternative to European co-operation) had been considered.

In a second question Mr Strachey asked whether the Minister would reconsider the whole question of space research programme anew "without any attempt to make use of the work put into the Blue Streak project." Mr Thorneycroft replied, "No, Sir. And I hope the right hon Gentleman will not confuse the question of co-operation in pure space research with the separate but important question as to whether Europe should leave the manufacture of satellite launchers to America and Russia."

Mr Strachey: "Surely these two questions are inextricably interlocked. As we understand it, the Minister has attempted to undertake a scheme of joint research on the basis of completing the Blue Streak project. Is he not aware that many of us think that this has turned out to be an error and that it would be far better simply to have a project of joint space research and if people wish to use the Blue Streak project that is for them? But I cannot help thinking that the Minister is putting off his possible collaborators by his present procedure."

Mr Thorneycroft: "Most questions are connected to some other question, but these happen to be different. One is whether we should co-operate in space research—everybody agrees that we should. The other is—and I agree that it could be answered either way—whether it would be right for Europe to say that in the West a complete monopoly should be left with the United States in the manufacture of satellite launchers, no matter what they were used for, whether space research or commercial purposes. This is a matter which I will not debate now . . ."

A Little Joe booster was used in an unmanned Project Mercury capsule test from Wallops Island, Virginia, which took place on March 19. The objective of the test was to check the operation of the escape pylon rocket system which, in case of emergency during or shortly after launch, would separate the capsule from the Redstone or Atlas booster

DOGGED DETAILS

Further information on the Soviet dog-carrying satellite which was placed in orbit and successfully recovered on March 9 was given in Moscow on March 11-12. According to the Soviet Academy of Sciences, "the purpose of sending various organisms in the fourth satellite space-ship was to obtain supplementary information concerning the effect of various spaceflight factors on the vital activity and physiological functions of organisms, and also to determine the immediate and long-term consequences of such flight."

A spokesman for the Academy said that the preliminary reduction of the telemetered data had shown that the entire equipment and automatic controls operated well both during orbital flight and landing, and ensured the carrying out of the predetermined programme. There was further evidence of the normal functioning and the required performance of the space-ship's life-support equipment. The orbital vehicle disengaged itself from the final-stage booster, its aerials were ejected, the orienting mechanism switched on, and automatic controls turned on and off during landing, all at the right time and in the required sequence. The thermal control system kept the interior temperature at between 16° and 20° C. The ship's interior air humidity ranged from 37 to 40 per cent. The bitch Chernushka was well throughout the flight and descent.

TIROS DEVELOPMENTS

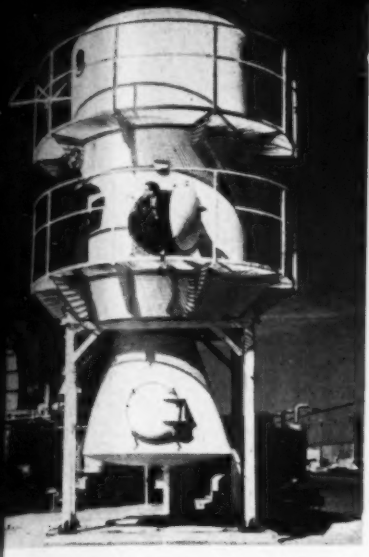
The suspension of photography by the narrow-angle and wide-angle cameras aboard the Tiros 2 experimental meteorological satellite (*Flight*, February 17) followed the acquisition of an impressive number of useful weather pictures. Shortly before the malfunction of the wide-angle camera, first observed on January 11, this instrument had taken over 11,100 photographs, of which over 9,500 could be effectively interpreted for practical weather analysis.

The narrow-angle camera had also functioned well, transmitting a total of 894 photographs, of which 545 were of practical use. The larger number of wide-angle pictures was decided by power limitations of simultaneous use of the two cameras and the fact that the wide-angle pictures were useful by themselves (whereas the narrow-angle photographs usually required concurrent wide-angle pictures for valid interpretation).

Transmission of the photographs from the satellite, and of the results of the infra-red experiments carried, was unaffected by the fault in the timing-clock operation which caused the suspension of photography. The reason for the decision to cease taking pictures was the danger of a total power drainage which might completely have disabled the satellite. A detailed synoptic analysis was not possible because of the earlier de-focusing of the wide-angle camera lens. The 21 foreign countries originally invited to participate in the Tiros 2 programme were advised of this, but orbital information and pictures were offered to those nations which still intended to carry out limited experiments. Eight countries accepted this offer.

The Tiros 2 experiment to part-control the orientation of the satellite spin axis is reported by NASA to have been highly successful. By using a simple magnetic system, ground observers can slowly change the angle of the satellite's axis in space. This system, developed by the Astro-Electronics Division of RCA in co-operation with NASA, has been used several times to change the angle of view of the infra-red and television equipment and to gain maximum power from the satellite's solar cells. The collection of infra-red data continues, and the information already analysed has indicated that the infra-red experiments are proving "generally successful."

With an estimated useful lifetime of only three months, Tiros 2 is essentially experimental and cannot be considered as an opera-



As described in an accompanying news-item, Convair Astronautics have almost finished this working model of a three - man space station. The tasks assigned to it include the investigation of human life-cycles, food preparation and preservation and water refrigeration

tional weather system. The wide-angle cloud pictures, however, are being used for limited weather analysis by the US Weather Bureau and the military meteorological services.

CONVAIR SPACE STATION

Illustrated in the photograph above is a full-scale mock-up of a three-man space station which is now nearing completion at Convair Astronautics. Although of "battleship" construction, the model is otherwise fully engineered and can duplicate a space environment in every respect save for lack of gravity. Living and working compartments are arranged at two levels, and attached beneath the structure is a Mercury-like detachable re-entry vehicle, which the three astronauts would enter in order to return to Earth. Late this year Convair will start putting the mock-up to practical use, in the investigation of all forms of life-support systems.

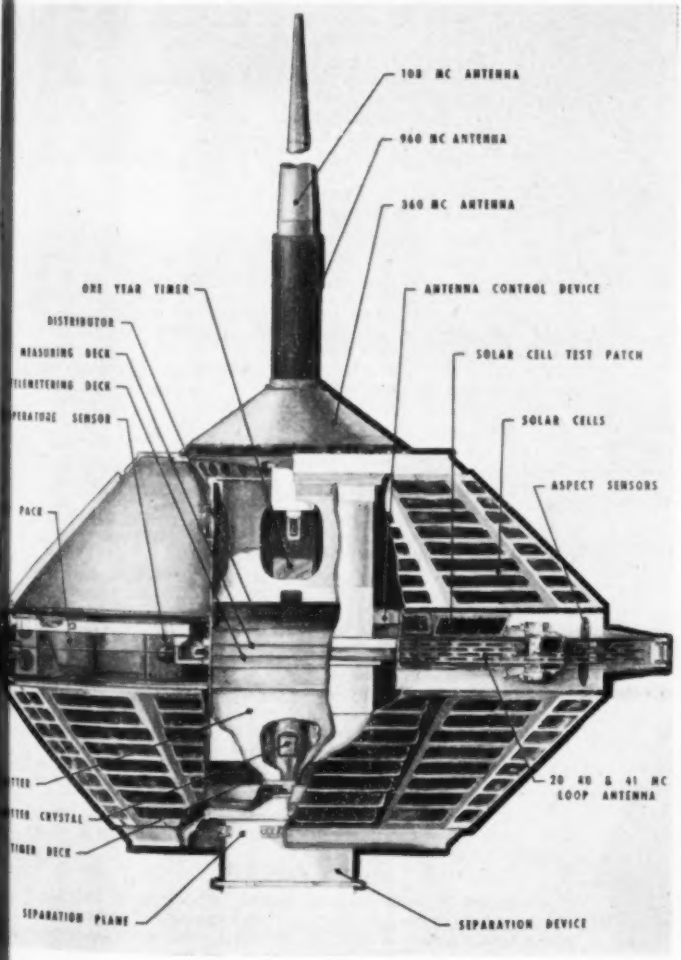
The two-day meeting of the preparatory commission of the European Space Research Organization, held in Paris on March 13-14, ended with the formation of a working group to examine the remaining technical problems. The commission will meet again in the Netherlands in May.

The Belgian Cabinet agreed conditionally on March 17 to co-operate in a European space launch vehicle programme along the lines proposed by Britain and France at the recent Strasbourg meeting. Agreement was reported to be subject to the participation of other European countries.

Martin Bullpup air-to-surface tactical missiles have now been procured in evaluation quantities for the Royal Navy, for eventual deployment as standard weapons with Scimitar and Buccaneer squadrons. Standard ASM-N-7 weapons are being bought, and according to the London *Daily Express* will "start tests with the Fleet Air Arm next month." Such a decision was forecast in our February 24 issue.

Not unexpectedly, the technical and scientific research council of Denmark has advised their government not to participate in the European space programme proposed jointly by Britain and France. Instead, it has recommended co-operation with ESRO (*Flight*, February 24), which is concerned solely with the planning and execution of scientific missions rather than with the engineering development of launch vehicles.

Transmissions from the Goldstone Tracking Station, California, were received back at the station after reflection from the planet Venus on March 10. The time taken for the return journey of some 70 million miles was about 6½min. The Deputy Administrator of NASA said that, although signals had been bounced off Venus previously, this was the first time such signals had been immediately detectable without elaborate analysis and processing. The Goldstone station is operated by the Jet Propulsion Laboratory of California Institute of Technology, and the experiment was one of a two-month series which is designed to obtain information about Venus.



Although it failed to achieve orbit, the S-45 payload of the Juno 2 shot of February 24 was a package of considerable interest. S-45 was an ionospheric beacon, carrying the equipment portrayed in the sketch on the left. In appearance the 74lb satellite resembled Explorers 7 and 8, with the addition of a 6ft LF loop aerial around its equator

James J. O'Reilly, a Hughes Aircraft test pilot, peers through a 36in aluminium disc used as a target at Holloman AFB for GAR-4A heat-seeking Falcons fired from an F-106. Several such discs were heated while suspended from a tower, and in this particular case the missile passed through while leaving the edge of the disc intact

FLIGHT SYSTEM SURVEY

Racal Instruments SA.509 jet engine speed tachometer installed in a TCA DC-8 with the sensing leads plugged into the points provided for the purpose. The r.p.m. read-out is digital

Calibrating Jet Engine Speed

A PORTABLE jet engine tachometer, designed by Racal Instruments Ltd and supplied to TCA, was recently demonstrated to airline and RAF representatives in a DC-8 at London Airport. The purpose of the instrument is to provide an exact measurement of compressor r.p.m., using the normal engine-driven tachometers, in order to assess the condition of the engine and to calibrate the cockpit instruments. The Racal SA.509, as it is called, fits neatly into a recess in the DC-8 cockpit wall and its leads are plugged into test sockets conveniently provided by Douglas. The instrument is also arranged to measure Rolls-Royce Tyne high- and low-pressure spool r.p.m. by simple adjustment of a selector knob: the necessary outputs would be taken from the r.p.m. gauge inputs.

Weighing 35lb in its portable case, the SA.509 contains a solid-state frequency meter which counts the revolutions of the tachometer output from an electro-mechanical multiplier during an accurately fixed time-interval. The reading is then displayed on latched digital counters until the next measurement is made. A test setting permits preliminary checking of the instrument. The multiplication factor is fixed at 60 to allow all measurements to be made in a maximum of six seconds. A new counting cycle is automatically begun after a fixed display-period of two seconds.

Weather by Closed-Circuit TV

IN collaboration with the Ministry of Aviation, Peto Scott Electrical Instruments Ltd have developed a closed-circuit television system for disseminating meteorological information to various parts of a control tower. Such a system must be as foolproof as possible, in order to ensure that the transmitted information is actually received at the various points and that a permanent record of the information is retained.

Weather conditions at any particular time are therefore written on a special form and placed face-downwards on a glass window on top of the TV camera console. As soon as the lid is closed, a 35mm camera photographs the form as displayed on a television monitor and red lights indicate that the information has reached the other screens. The recipients then cancel warning lights on their own receivers as soon as they have used the information. A warning light also indicates failure or end of film in the camera. The first equipment is being sent to Bahrein Airport.

Elliott-Litton Co-operation

NEGOTIATIONS for co-operation in the microwave valve field have been successfully completed between Elliott Brothers (London) Ltd and Litton Industries Inc. A new £400,000 company, Elliott-Litton Ltd is to be formed at Manor Way, Borehamwood, Herts. Both companies have considerable experience of microwave tubes, Litton Industries with their Electron Tubes Division and Elliott in pioneering development of high-power microwave valves for the millimetre wave-bands. Elliott will assume responsibility for the principal British and Commonwealth interests of the Electron Tube Division of Litton; and it is the intention of the new company to combine the knowledge and skills of the two parent companies and greatly extend the markets for their developments.

Closed-circuit TV transmission of weather information by Peto Scott Electrical Instruments Ltd. Each form is photographed and reception at the remote screens is positively registered. This set is for Bahrein

3-D Radar and Collision Avoidance

THE Federal Aviation Agency has made preliminary trials of the new Air Height Surveillance Radar (AHSR) at Atlantic City and has begun tests of a Sperry Luneberg lens aerial for collision-avoidance purposes.

The AHSR is a passive radar with a 165ft-high, three faced fixed aerial which derives height information in conjunction with a normal surveillance radar. During the initial trials a Tri-Pacer was tracked through a series of climbs and descents and accuracies of "within 500ft at 20 miles" were obtained. The equipment had not yet been fully adjusted. Signals were presented on the ground in the form of an altitude-filtered c.r.t. display tracking the test aircraft at between 3,500ft and 4,500ft. The radar should eventually be able to separate two aircraft which are on the same bearing, 50 n.m. from the aerial but 1,000ft apart vertically.

The Luneberg lens aerial is part of a Sperry collision-avoidance system which is intended to give bearing, range and height information relative to two aircraft and to initiate avoiding action through the autopilot. A simplified warning device is also possible. The aerial is at present being tested for its ability to provide all-round as well as directional coverage.

White Light for Cockpits

FILTERED white cockpit lighting, instead of the traditional red lighting, is being provided as standard in Northrop T-38 supersonic trainers for the USAF. It has been found that pilots' eyes adapt just as quickly from pure white light to night vision as from red light; and white light allows much greater colour discrimination in maps and instrument markings. The necessary pure white is produced by blue filters.

White light has been applied as a replacement for existing red systems in some USAF aircraft, but the T-38 application is the first to be specified from the outset as standard.

Sarah rescue receivers, made by Ultra Electronic Ltd, are to be fitted in a further six Gannets of the Indonesian Navy. Delivery is to begin during this year.

Through their Canadian agents, C.M.C., Marconi Instruments Ltd have received a $160,000 order from the RCAF for Type TF 801D/1 signal generators for the 10 to 470Mc/s band.

The RAF has ordered a further 300 Type D.103 airborne emergency UHF transmitters from WS Electronics Ltd. They are designed for exceptional reliability and operate on distress and one other frequency.

A Marconi S.232/2 surveillance radar has been ordered for the French Centre d'Essais en Vol at Istres. Similar equipment has been in use at Brétigny for some years. The S.232/2 is an improved and modernized version of the established 50cm, 50kW S.232.

The instrumentation division of AEI has dispatched a Type MS7 spark-source mass spectrometer to Radio Corporation of America. Valued at £20,000, this MS7 is the first to be exported, but other orders are on hand for Holland, Germany, Switzerland and Russia.

The International Association of Cybernetics has issued the proceedings of the 2nd International Congress on Cybernetics held at Namur, Belgium, in September 1958. The document includes 80 papers in 1,000 pages and can be obtained from Association Internationale de Cybernétique, A.S.B.L., Rue Basse-Marcelle 13, Namur, Belgium for 800 Belgian francs.

civil or military

twin engine Mobility

Designed primarily for military use, this twin engined twin rotor helicopter, the Belvedere, which has recently gone into service with the Royal Air Force can carry 19 fully equipped troops over a range of 400 nautical miles and can prove to be an extremely useful vehicle in the field of tactical mobility. As a civil passenger vehicle it can be developed as an airliner to carry up to 23 passengers in comfort from city centre to city centre or on feeder line work. A feature of the Belvedere is its ability to operate with full payload on only one engine. The design of the transmission system automatically permits both rotors to be driven by either engine should circumstances dictate. This capability is a special requirement for the commercial use of the modern helicopter and the civil version of the Belvedere is well suited in this respect.

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GOODYEAR AVIATION DIVISION

SERVING AVIATION THE WORLD OVER

Private and Executive Flying

Constructive ideas and useful facts are once more the backbone of "Flight's" annual special feature devoted to light aviation in Britain. Ideas on effective co-operation between the Ministry of Aviation and those outside, emergency techniques for bad-weather flying, and aspects of business aviation are put forward; and relevant facts are given on aircraft available and in prospect, on clubs and on costs of private and business flying. Both on the aircraft market—fifty available types are illustrated—and in this special section of "Flight", there should be something for everybody

PRIVATE FLYING'S PROBLEMS

IT would be optimistic to expect that 16 people gathered around a conference table could solve all the problems facing British private, club and business flying today. If the group had no power of action, and if its members had different ideas on what the problems were—let alone on how to try to solve them—one might dismiss the whole notion as supremely impracticable.

No longer new is the ironic definition of the camel as "a horse designed by a committee." But today a certain committee is designing the shape of private flying in Britain for the next ten years. Let us take a look and find out what sort of animal these gentlemen have in mind.

The committee was born of mistrust out of failure to communicate. Private and club pilots' antagonism towards the Ministry of Transport and Civil Aviation, as it then was, reached a peak at about the time of the closure of Croydon Airport in 1958. Private flying, it was felt, was the neglected Cinderella, with the airlines and the RAF as the ugly, but powerful, sisters. The Ministry just did not understand and, the cynics added, did not wish to do so.

This was partly, but not wholly, true. Within the Ministry, light aviation had its sincere friends, who did what they could up to the ceiling of their own influence. But there was no indication that the needs of private and club flying were of the slightest relevance at the policy-making levels. The trouble, it seemed, was caused not by hostility, but simply by ignorance.

The need for closer communication with the light-aircraft movement became recognized at this time within the Ministry, with a

Most recent meeting of the Standing Joint Committee on Private and Club Flying and Gliding was held at the Ministry of Aviation on February 28. In this "Flight" photograph, the first to be published of the committee in session, are (clockwise around the table from the chairman, beneath clock):

Geoffrey Rippon, Parliamentary Secretary, Ministry of Aviation; L. C. Nash, Aviation Safety and General Division, MoA (committee secretary); Miss E. V. Crux, MoA shorthand writer; Peter G. Masefield, Popular Flying Association; Philip A. Wills, British Gliding Association; Mrs Ann Welch, British Gliding Association; G. H. M. Miles, Association of British Aero Clubs; J. T. Penwarden, W. F. Rimmer and J. L. Delsford, representing the Director-General of Navigational Services, MoA; W. E. B. Griffiths, Aviation Safety Directorate, MoA; N. Craig, Air Division, MoA; B. E. Robson, Air Ministry; G. H. Gillings, Aerodromes Planning Division, MoA; G. F. Gainsborough, Aerodromes Planning Division, MoA; S. R. Walton, Aviation Safety and General Division, MoA; and R. R. Goodison, Under-Secretary, Aviation Safety and General Division, MoA. Mr Goodison is the Ministry Under-Secretary with general responsibility for private flying and gliding. Not all persons present are members of the committee, and not all members of the committee were present (see text)

PRIVATE AND EXECUTIVE FLYING...

Private Flying's Problems...

feeling that a high-level co-ordinating committee was needed. How high the level? Parliamentary-secretary level, it was decided. With Mr Airey Neave as chairman, therefore, the Standing Joint Committee on Private and Club Flying and Gliding came into being in October 1958.

The aim of the new group was "To assist the Minister in keeping under review all matters appertaining to the development of private and club flying and gliding in the United Kingdom." Its membership came both from the Ministry and from outside bodies. In the committee's brief history to date Mr Neave was succeeded by Mr John Hay, who in turn has been succeeded by Mr Geoffrey Rippon. What is the composition of the committee in 1961, how does it work, and what has it accomplished since 1958?

The committee consists of eight men from the Ministry of Aviation, including the chairman and secretary, and seven men and one woman from the four outside organizations which represent the various private-flying interests. Two members each were nominated by the Association of British Aero Clubs, the British Gliding Association, the Popular Flying Association and the Royal Aero Club.

The ABAC is represented by Mr G. H. M. Miles and Wg Cdr R. J. B. Pearse; the BGA by Mr Philip Wills and Mrs Ann Welch; the PFA by Mr Peter Masefield and Mr David Armstrong; and the Royal Aero Club by Mr J. J. Dykes and Mr. R. R. Stephenson. On the Ministry side, the members of the committee are the Parliamentary Secretary, Mr Rippon; Mr L. C. Nash (secretary); Mr S. R. Walton, Aviation Safety and General Division; Mr N. Craig, Air Division; Mr G. F. Gainsborough, Aerodromes Planning Division; Mr W. E. B. Griffiths, Aviation Safety Directorate; Gp Capt J. B. Veal, Director-General of Navigation Services; and Mr R. R. Goodison, Under Secretary, Aviation Safety and General Division.

For the representatives of the light-aviation bodies, membership of the committee is on a personal basis: if they themselves are unable to attend, they cannot send along deputies. This applies also to the Ministry side, but the committee has found it useful to have MoA specialists present in an advisory or observing capacity for particular discussions. These two points are well illustrated in the photograph of the February 28 meeting, which was attended by fewer outside members, and perhaps more Ministry people, than is usual.

Mr Airey Neave

Another important point is that all discussions are open to all members of the committee: comments and suggestions by the BGA representatives, for example, are not limited to gliding topics. It would be surprising, also, if Mr Masefield (who is chairman of the RAeC Aviation Committee as well as PFA member of the joint committee) failed to represent Royal Aero Club views in the unavoidable absence, as on February 28, of the club's nominated members.

Meetings of the committee are held at intervals of approximately three months, except for a longer gap which occurred at the time of the general election. Subcommittees have been formed for specific studies, but the main flow of information is based on papers and reports written by members and discussed by the full committee.

In all its deliberations the recognized aim is for current problems to be aired and, if possible, solved by joint agreement. The presence of the Parliamentary Secretary implies that the Minister will not be unaware of the problems, and the fact that the committee proceedings are confidential permits Ministry officials to indicate future plans which might not have been publicly announced.

The committee is inevitably limited because of its terms of reference. Its job is not to enforce action nor to draw up the appropriate regulations. Neither is it meant to replace the normal channels of communication between those inside and those outside the Ministry. On the other hand, its field of interest is interpreted widely, to cover all applications of private, club and business aviation, and within this field it endeavours to find solutions to the problems facing the movement. In the course of its reviews the committee can draw the Minister's attention to problems which it has not been able to handle itself.

Three subcommittees have been formed to date, concerned respectively with aircraft, radio and aerodromes. Specifications for a light training aircraft and for inexpensive radio equipment having been written and circulated, the first two of these subcommittees have completed their work. The crippling shortage of aerodromes continues to occupy the aerodromes subcommittee at present.

The committee claims a share of the credit for a number of achievements in addition to producing the aircraft and radio specifications. These include the relaxation of ARB airworthiness requirements for light aircraft; removal of import restrictions on foreign aircraft; and steps towards the issue of a simplified flight guide (a crusade in which, readers may recall, *Flight* has also played an active part).

Mr John Hay

The relaxation of restrictions on light aircraft at London Airport, the continuance of the petrol-tax rebate for clubs, and the security of tenure of Lasham Gliding Centre must also have been among the committee's major topics of discussion in recent months.

Behind the major problems and achievements lies the routine background work involved in preparing committee papers on a variety of subjects. The number and titles of papers produced is regarded by the Ministry as confidential, but the main problems are all too well known and could be listed without undue strain by most people in the light-aviation business.

Perhaps the most concise single outline of the major problems was contained in the article *What Course for the Private Pilot?* in the 1960 Sport and Business Flying issue of *Flight*. Six main headings were given: (1) new aircraft, (2) new flying aids, (3) benevolent legislation, including the provision of a simplified Air Pilot, (4) freedom of the air, including access to aerodromes in control zones, (5) greater responsibility on the part of the private pilot, possibly with the introduction of a limited instrument rating, and (6) contact airways. Various aspects of the first four of these, in particular, have presumably been the subject of many of the committee's reports.

In addition, a first review of the committee's work was written during 1959 and submitted to the Minister; a second review is now being prepared. This will include an outline of what has been accomplished and what remains to be done.

This, then, is how the Standing Joint Committee has worked, and these are some of its achievements. Is it working efficiently, and could it achieve more?

The following points might occur to the outsider:—

(1) Four meetings per year does not seem a particularly intensive rate of working, in view of the size and number of problems.
(2) The blanket in-confidence rule of silence does not seem justifiable. Although committee members need to be given confidential information, this should not prevent regular public announcements being made of the committee's work. The Ministry has undoubtedly gained the confidence of the eight outside members, and *vice versa*, but the committee itself has yet to gain the confidence of the private-flying public.
(3) The effectiveness of the committee depends on the effectiveness of the chairman, and parliamentary secretaries come and go relatively frequently these days. A change in chairman can mean a drastic change in the tempo of the committee's work.
(4) At present the committee works within the existing MoA policy framework in an endeavour to effect improvements on detail points. Still lacking is a Government statement of the principle of active support for light aviation in general.

At its very least, the Standing Joint Committee is useful as a safety valve and as a forum for the outspoken exchange of views. At its best, it can give the inspired lead and sense of direction which private flying needs more than anything else at this time.

On the one hand, it has an impressive array of brainpower ready to be focused on the important problems. On the other hand, it must inevitably suffer from the effects of conflicting political, technical, personal and commercial pressures.

In its work so far, the committee has done a good job in clearing the decks for action and in tackling specific problems. The time has now come for it to strive for a new and progressive official philosophy of positive encouragement for light aviation which would set the pattern for the next ten years. And, having planned this pattern, the committee should be a little less reticent about telling us all about it.

KENNETH OWEN

The time has come to buy a

DE HAVILLAND DOVE 8

EXECUTIVE AIRCRAFT

de Havilland Gipsy Queen 70 Mk.3 400 b.h.p. engines de Havilland Hydromatic three-blade propellers

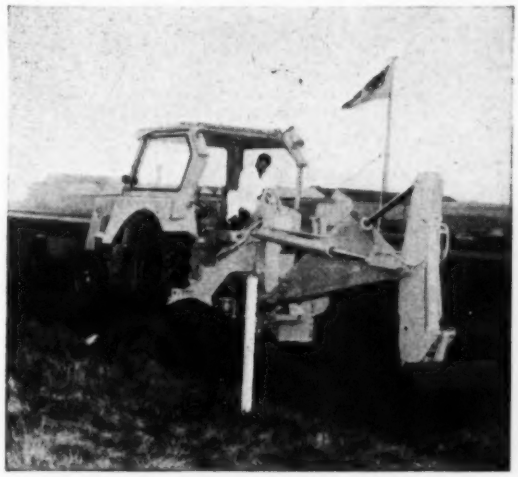
The time has come when J. C. BAMFORD (EXCAVATORS) LTD., of Rocester, Staffordshire, England, which in fifteen years has been built up by the enterprise of one man to a position of renown and leadership in the manufacture of earth-moving machines, cannot do without a company-owned aircraft for urgent travel.

J. C. Bamford Excavators and Loaders are coming off the Rocester assembly line at 120 a month and 43 per cent go for export. This is now the largest business of its kind in Europe.

The close contact with users at widely scattered sites, on which Mr. J. C. Bamford insists, demands quicker, more flexible travel facilities than are possible by public transport.

He states that a privately owned aircraft with comprehensive equipment to ensure all-weather flying has become not merely justified but an essential factor in the further development of his sales and service.

After thorough competitive evaluation of all available aircraft in Europe and America, J. C. Bamford purchased the new Dove 8 Executive, de Havilland built and de Havilland powered. This will carry six passengers and two crew on practical stages of about 600 miles at 210 miles an hour.



HAWKER SIDDELEY AVIATION

D

David Owen buys a four-seater

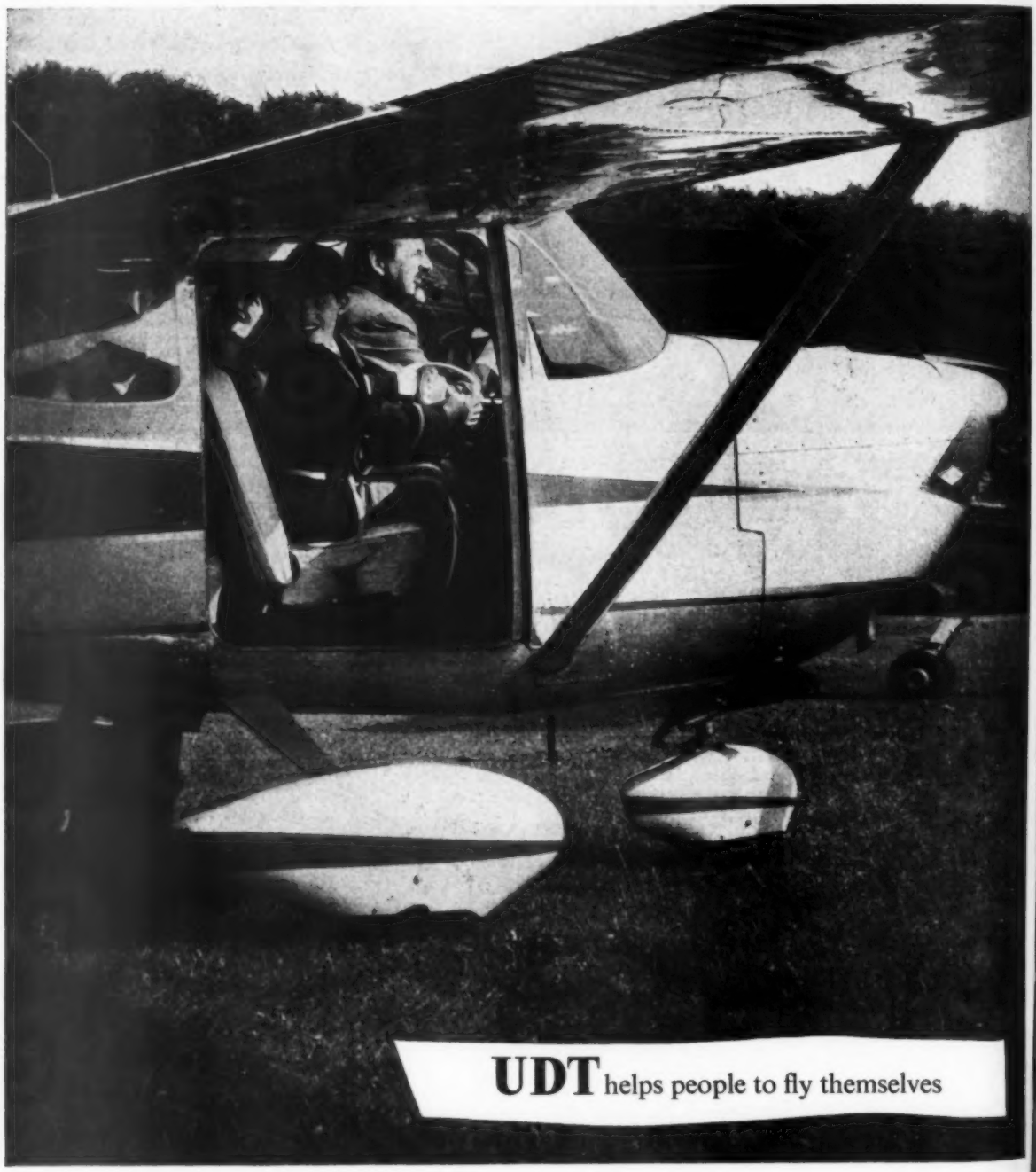
(with a little advice from Dad)

What's the use of a pilot father if he hasn't a plane to pilot? True, Dad's old plane was a Lancaster, a shade bigger than this . . . but David's quite prepared to settle for this neat tourer.

So from now on, all Europe's at the feet of the Owen family—fishing in Scotland or racing at Le Mans, week-end trips and holidays wherever they choose. And all at a cost not so very much more than a good motor car.

With UDT to finance him, David's father can pay for the aircraft over the months out of income, leaving his capital intact—a really practicable proposition.

Whether you're buying for business or pleasure—executive aircraft, family tourer or club trainer—UDT will help pay for it. UDT will help, too, to finance training courses for the Private Pilots Licence. Any A.B.A.C. Member Club will give you full details.



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PRIVATE AND EXECUTIVE FLYING...

What's this One-eighty Rating?

AOPA's 180° RATING

HANDS OFF CONTROLS	CENTER NEEDLE
GEAR DOWN	CENTER NEEDLE
THROTTLE BACK	CENTER NEEDLE
TRIM TO MARK	CENTER NEEDLE
THROTTLE_____, HIGH R.P.M.	CENTER NEEDLE

The life you save will be your own

IN Beech Bonanzas and Beech Debonairs sold in the United States—and perhaps in other types besides—the instrument panel bears the placarded instruction:—

IN CLOUDS USE RUDDER PEDALS ONLY AND MOVE THEM GENTLY. DO NOT TOUCH WHEEL OF CONTROL COLUMN UNTIL YOU BREAK OUT BELOW CLOUDS. TO DO SO IS TO INVITE INVOLUNTARY AEROBATICS AND A FATAL ACCIDENT.

What extraordinary doctrine is this, which apparently offends against the most basic tenets of instrument flight? As all pilots with instrument experience will know, the first precept of straight-and-level blind flying is to centre the turn needle—and then to get the aircraft in balance by checking slip and climb or descent.

But the point of these instructions is that they are designed for the pilot who has no instrument experience at all, and who, having entered cloud, wants safely to leave it as quickly as possible. This is the aim of the 180° rating, a technique pioneered by the US Aircraft Owners and Pilots' Association and developed for them by the Institute of Aviation of the University of Illinois.

Not by any stretch of the imagination instrument flying, it is a crude but effective procedure which enables the non-instrument pilot, with a minimum of training, to retain control of his aircraft in instrument weather and descend or fly back into the clear. And in spite of years of opposition from those who considered that "a little (instrument) knowledge is a dangerous thing" its vindication became absolute when, last year, it was adopted by the FAA as a standard requirement for a US private pilot's licence.

The technique depends upon an aircraft's inherent stability. The only control surface used is the rudder, and the only flight instruments the turn needle and magnetic compass. On entering cloud, or otherwise losing "contact," the pilot keeps the turn needle centred. He then takes his hands off. This is to avoid the danger of overcontrolling; the aircraft is left to find, through a series of phugoid oscillations, its natural trimmed speed.

Next, the pilot lowers the undercarriage, even if the aircraft is above normal gear-down speed. (An exception to this would be made were it structurally unsafe.) This is to increase drag and reduce the possibility of gaining excessive speed. Then, power is reduced to just above idling, and the trim is adjusted to a position for low safe speed on full aft c.g.—something between approach speed and about 2Vs. It is an important part of the technique that this trim position should be pre-marked; similar marking is required for the throttle, which is then moved to a position that will give sufficient power for height to be maintained. With a variable-pitch propeller, the pitch should be fully fine (max r.p.m.).

Each of the foregoing steps will be accompanied by a change of longitudinal trim. All are ignored; the 180° rating pilot is taught to minimize them by following through each step in turn without hesitation. All the while, the turn needle must be kept centred, or in rough weather, the average of swings must be balanced out.

With the aircraft in balance, heading is read off and the reciprocal noted. A rate 3 turn through 180° is then started on rudder alone, and at as nearly a constant rate as possible. Less than a standard rate of turn is used to reduce bank angle and centrifugal loading. The reciprocal heading is regained by ruddering-out with appropriate lead or lag to compensate for turning errors of the magnetic compass. This should bring the VFR pilot back into the clear. If after a few minutes it does not, he continues with the procedure, reducing power to give a 400-500ft/min rate of descent—if necessary right down to ground level. A VFR pilot caught out in instrument weather may thus stand a better chance of survival than by attempting to fly on his basic instruments.

Just how little chance of success instruments give an untrained pilot is shown by tests conducted by the Institute of Aviation on 20 non-instrument pilots, some with well over 1,000hr experience. "Nineteen subjects," says their report, "placed the aircraft in a graveyard spiral on their first attempt to fly by instruments. The twentieth pulled the aircraft up into a whip stall. Minimum time to reach an incipiently dangerous attitude was 20 sec; maximum was eight minutes." The average was two seconds under three minutes.

Total time required thoroughly to train a pilot in the 180° rating technique is about six hours. The first part of the training consists of allowing the pupil, in an aircraft equipped with blue goggles and amber screens, to try instrument flying for himself; he is rescued before hitting the ground. But not too soon before, because it is regarded as essential that every pilot should be allowed to convince himself that he cannot fly on instruments without special training and practice. Then he can be taught the rating technique of keeping the aeroplane under control—the sloppiest kind of control, but nevertheless under definite control.

Is there a place for the 180° rating in Great Britain? It may well be that there is. There may not be much reason to enter instrument weather when flying just for fun, but on business journeys the temptation to press on when contact is lost is a real one. And with an instrument rating so far out of reach for most amateur pilots, should not Ministerial approval be given to a simple life-saving procedure?

It Works in Practice

The FAA have developed in recent trials an effective controlled-descent system in which the pilot uses only these 180°-rating techniques—a trimmed, hands-off let-down in which heading is adjusted only by rudder movements and by reference to a turn indicator or directional gyro. The pilot prepares for the descent from 1,500ft above cloud by slowing down, lowering flap and undercarriage, and following a step-by-step procedure given over the radio by the ground controller. On 98 of 102 test let-downs by 54 non-instrument pilots the technique worked successfully. No such get-you-down procedure is available in Great Britain, although opportunities for error are just the same. The only possible alternative, a GCA or QGH let-down, demands a certain competence at instrument flying.

It may of course be argued that provision of such emergency procedures undermines the value of a proper instrument rating, and that a 180° rating training would only encourage private pilots to exceed their own limitations. This is what Max Karant, vice-president of the AOPA, has to say on the subject:—

"You would think that such proven, simple safety techniques would be easy to sell. Unfortunately, history has once again repeated itself. The hardest commodity we in aviation have to sell is safety. There are safety devices, safety techniques, safety know-how—all readily available, but not saleable. Examples: shoulder harnesses, cabin structures designed for maximum occupant protection, stall-warning equipment, cross-wind landing gear—and the 180° rating. At the moment, we have 87,000 paid-up members, all of them pilots and/or aircraft owners. We have continuously bombarded them with information on the technique which they actually paid for. And yet, only a total of 1,040 AOPA members (including instructors) have qualified in six years."

The FAA's predecessors, the CAA—who had been watching the development closely—eventually took a hand, and when the FAA was founded they made new requirements for a private pilot's licence (based on the same 180°-rating techniques) into law.

"Why the indifference during the voluntary programme?" asks Max Karant. "A major factor was, I think, the strong opposition to the entire concept by professional flight instructors. To them, the 180° rating (and now the FAA requirement) are a far greater hazard than the hazard they set out to cure. They take the position that 'a little knowledge is a dangerous thing,' and that pilots so trained were sure to go out and try instrument flying and get themselves killed. The record does not support this. As I wrote several times in answer to the contention about 'a little knowledge'—'if a little knowledge is a dangerous thing, show me a man who is safe.'"

Is the 180° rating a hazard, or a hazard cure? Something to help the foolish or unlucky amateur or inadequate and dangerous education in instrument flight? The FAA have made up their minds—and they have a habit of being right. ALASTAIR PUGH

PRIVATE AND EXECUTIVE FLYING . . .

Off the shelf

Fifty of the best new aircraft now available to the private and executive owner—both from British manufacturers and through UK agents for foreign types—are illustrated in this feature. Due to appear later this year are the new BEAGLE types, discussed together with others in the article "Aircraft in Prospect" on pages 380-381.

Aero Commander 500B (two 290 h.p. Lycomings)
Seven seats, 49ft 6in span, 218 m.p.h. cruise, 1,250 miles range, £36,550 (Also 500A, £33,822; 560F, £43,683; 680F, £49,980)
Field Aircraft Services Ltd, 72 Wigmore Street, London W1

Aeromere Falco (150 h.p. Lycoming)
Two seats, 26ft 2in span, 170 m.p.h. cruise, 700 miles range, £4,700
J. L. Shaw, 22 Rawson Road, Bradford

Aircoupe Execta (90 h.p. Continental)
Two seats, 30ft span, 120 m.p.h. cruise, 500 miles range, £3,575
Air Rent Ltd, Stapleford Aerodrome, Essex

Auster D.6/180 (180 h.p. Lycoming)
Four seats, 36ft span, 133 m.p.h. cruise, 490 miles range, £4,400 (also forthcoming BEAGLE-Auster range)
Auster Aircraft Ltd, Rearsby, Leicester

Aviation Traders Prentice (250 h.p. DH Gipsy Queen)
Six seats, 46ft span, 130 m.p.h. cruise, 805 miles range, £2,250 (four-seater), £2,500 (six-seater)
Aviation Traders (Engineering) Ltd, Southend-on-Sea, Essex

Beechcraft N35 Bonanza (260 h.p. Continental)
Five seats, 33ft 5.5in span, 195 m.p.h. cruise, 1,200 miles range, £12,185

Beechcraft 55 Baron (two 260 h.p. Continentals)
Five seats, 37ft 10in span, 216 m.p.h. cruise, 1,220 miles range, £25,873
Aircraft Associates Ltd, 26 Old Bank Buildings, Chester, and Short Bros & Harland, Belfast; joint distributors for Beech

Beechcraft A33 Debonair (225 h.p. Continental)
Four seats, 32ft 10in span, 185 m.p.h. cruise, 1,160 miles range, £9,995

Beechcraft Super G18S (two 450 h.p. Pratt & Whitneys)
Nine seats, 49ft 8in span, 204 m.p.h. cruise, 1,200 miles range, £57,732

Beechcraft 65 Queen Air (two 340 h.p. Lycomings)
Eight seats, 45ft 10.5in span, 214 m.p.h. cruise, 1,445 miles range, £54,630

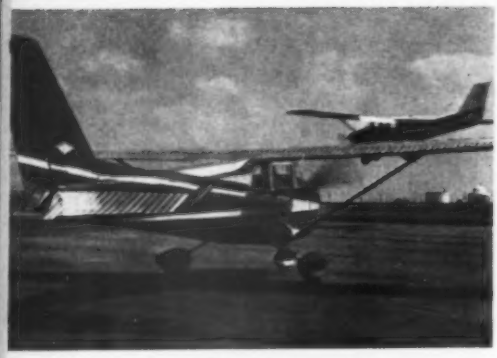
Beechcraft B95 Travel Air (two 180 h.p. Lycomings)
Five seats, 37ft 10in span, 200 m.p.h. cruise, 1,410 miles range, £22,967

Bellanca 260 (260 h.p. Continental)
Four seats, 34ft 2in span, 203 m.p.h. cruise, 880 miles range, £8,750
Aircraft Associates Ltd, 26 Old Bank Buildings, Chester

Beechcraft J50 Twin-Bonanza (two 340 h.p. Lycomings)
Seven seats, 45ft 11.5in span, 223 m.p.h. cruise, 1,250 miles range, £43,600

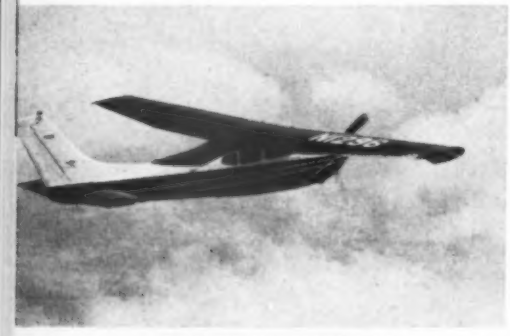
Bolkow-Klemm Kl 107C (150 h.p. Lycoming)
Three seats, 35ft 6.5in span, 115 m.p.h. cruise, 422 miles range, under £4,000
Flair-Aviation Sales Co, Tower House, College Road, Bromley, Kent

Off the shelf



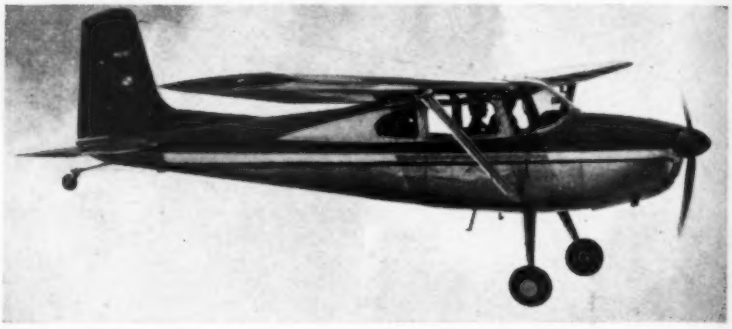
Cessna 175 (175 h.p. Continental)
Four seats, 36ft span, 140 m.p.h. cruise, 590 miles range, £5,548 (also Skylark, £6,295)

Cessna Skylane (230 h.p. Continental)
Four seats, 36ft span, 160 m.p.h. cruise, 845 miles range, £8,069 (also 182, £7,035)



Cessna 210 (260 h.p. Continental)
Four seats, 36ft 6in span, 190 m.p.h. cruise, 755 miles range, £10,814

Cessna 150 (100 h.p. Continental)
Two seats, 33ft 4in span, 121 m.p.h. cruise, 520 miles range, £3,602
Airwork Services Ltd, Panshanger, Herts: distributors for Cessna Aircraft Co



Cessna 180 (230 h.p. Continental)
Four seats, 36ft span, 160 m.p.h. cruise, 675 miles range, £6,945

Cessna 185 Skywagon (260 h.p. Continental)
Six seats, 36ft span, 165 m.p.h. cruise, 770 miles range, £8,482

Cessna 310F (two 260 h.p. Continentals)
Five seats, 36ft span, 220 m.p.h. cruise, 825 miles range, £27,410

Champion Tri-Traveler (95 h.p. Continental)
Two seats, 33ft 5in span, 108 m.p.h. cruise, 500 miles range, £2,685
Maitland-Drewery Aviation Ltd, 128 Station Road, Sidcup, Kent

Hampshire Currie Wot (60 h.p. Walter Mikron)
Single seat, 22ft 1in span, 85 m.p.h. cruise, 350 miles range, £1,200 (photograph shows Rover TP60/70 turbine test-bed)
Hampshire Aeroplane Club, Eastleigh Airport, Southampton

D.H. Dove 8 (two 400 h.p. DH Gipsy Queen 70s)
Seven seats, 57ft span, 195 m.p.h. cruise, 1,000 miles range, £38,500
de Havilland Aircraft Co, Hatfield, Herts

Fairey Tipsy Nipper (45 h.p. Stark Stamo)
Single seat, 19ft 8in span, 93 m.p.h. cruise, 200 miles range, £1,275
Association of British Aero Clubs, 7c Lower Belgrave Street, London SW1

Garland Linnet (90 h.p. Continental)
Two seats, 26ft 4in span, 115 m.p.h. cruise, 700 miles range, £2,750
Garland Aircraft Co, Dale House, Clewer Green, Windsor, Berks

Helio Courier H-395A (260 h.p. Lycoming)
Five seats, 39ft span, 145 m.p.h. cruise, 582 miles range, £14,250 (also Super Courier H-395, £15,390)
Autair Ltd, 75 Wigmore Street, London W1

Jodel D.117 (95 h.p. Continental)
Two seats, 27ft span, 121 m.p.h. cruise,
725 miles range, £2,500
Rollason Aircraft and Engines Ltd, Croydon Airport, Surrey (agents for Jodel types)

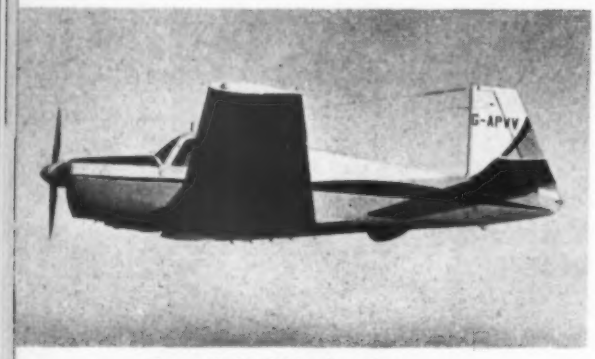
Jodel DR.100 Ambassador (90 h.p. Continental)
Three seats, 28ft 8.5in span, 112 m.p.h. cruise,
620 miles range, £2,800

PRIVATE AND EXECUTIVE FLYING...

Off the Shelf

Jodel D.140 Musketeer (180 h.p. Lycoming)
Four seats, 33ft 6in span, 140 m.p.h. cruise,
800 miles range, £4,500

Lancashire Prospector 1 (295 h.p. Lycoming)
Five seats, 43ft 6in span, 120 m.p.h. cruise,
760 miles range, £9,360 (Cheetah-powered Mk 2 illustrated)
Lancashire Aircraft Co Ltd, Samlesbury Airfield, Blackburn, Lancs



Mooney Mk 21 (180 h.p. Lycoming)
Four seats, 35ft span, 164 m.p.h. cruise,
630 miles range, £7,440 (Mk 20A illustrated)
Travelair Ltd, 115 Oxford Street, London W1

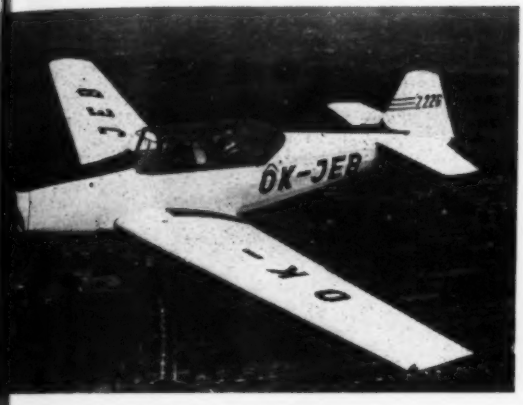
Morane Rallye (90 h.p. Continental)
Three seats, 31ft 5.5in span, 106 m.p.h. cruise,
500 miles range, £2,450
London Aeroplane Club, Panshanger Aerodrome, Herts

Omnipol Aero 145 (two 140 h.p. Walter M332s)
Five seats, 40ft 2.5in span, 155 m.p.h. cruise,
1,055 miles range, £11,850
Peter S. Clifford & Co Ltd, Kidlington Airport, Oxford (agents for Omnipol)

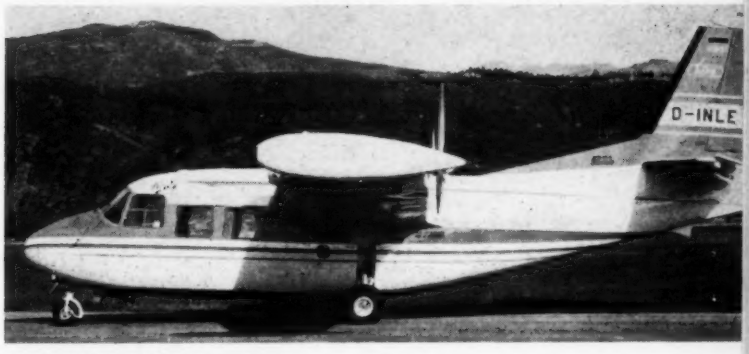
Motoimport PZL.102 Kos (95 h.p. Continental)
Two seats, 27ft 9in span, 108 m.p.h. cruise,
400 miles range, £2,500
Norco Engineering Co, 62 Church Road, Burgess Hill, Sussex

Omnipol L-40 Meta-Sokol (140 h.p. Walter M332)
Four seats, 33ft span, 134 m.p.h. cruise, 688 miles range, £4,800

Omnipol L-200A Morava (two 210 h.p. Walter M337s)
Five seats, 40ft 4.5in span, 183 m.p.h. cruise, 1,180 miles range, £18,600



Omnipol Zlin Z-226 (160 h.p. Walter Minor)
Two seats, 33ft 9in span, 121 m.p.h. cruise, 300 miles range



Piaggio P.166 (two 340 h.p. Lycomings)
Six seats, 46ft 9in span, 193 m.p.h., 846 miles range, £40,939
Aero-Enterprises (Boreham Wood) Ltd, 17 Drayton Road, Boreham Wood, Herts

Piper Aztec (two 250 h.p. Lycomings)
Five seats, 37ft span, 200 m.p.h. cruise, 1,200 miles range, £23,492
Vigors Aviation Ltd, Kidlington Airport, Oxford (agents for Piper Aircraft Corp)

Piper Apache (two 160 h.p. Lycoming)
Five seats, 37ft span, 173 m.p.h. cruise, 840 miles range, £17,172

Piper Caribbean (150 h.p. Lycoming)
Four seats, 29ft 3in span, 132 m.p.h. cruise, 645 miles range, £4,563

Piper Cherokee (160 h.p. Lycoming)
Four seats, 130 m.p.h. cruise, Approximately £4,200

Piper Comanche 250 (250 h.p. Lycoming)
Four seats, 36ft span, 181 m.p.h. cruise, 740 miles range, £9,748 (also Comanche 180, £8,021)

Piper Colt (180 h.p. Lycoming)
Two seats, 29ft 3in span, 108 m.p.h. cruise, 324 miles range, £2,795

Rollason Turbulent (30 h.p. Ardem)
Single seat, 21ft 5in span, 75 m.p.h. cruise, 200 miles range, £945 (40 h.p. version, £1,040)
Rollason Aircraft and Engines Ltd, Croydon Airport, Surrey

PRIVATE AND EXECUTIVE FLYING...

Off the shelf

Scintex Emeraude (95 h.p. Continental)
Two seats, 27ft 1in span, 124 m.p.h. cruise, 620 miles range, £2,392
Tricolore Trading Company, 13 Suffolk Court, Leigham Cour Road, London, SW16

Putzer Elster B (95 h.p. Continental)
Two seats, 43ft 4in span, 93 m.p.h. cruise, 280 miles range
Flair-Aviation Sales Co, Tower House, College Road, Bromley

Piper Super Cub (150 h.p. Lycoming)
Two seats, 35ft 3.5in span, 115 m.p.h. cruise, 460 miles range, £4,236

Wiltshire Jackaroo (130 h.p. DH Gipsy Major 1)
Four seats, 30ft 4.5in span, 85 m.p.h. cruise, 250 miles range, £1,270
Wiltshire School of Flying Ltd, Thruxton Aerodrome, Thruxton, Andover, Hants

Jack Milligan buys a business plane

(Sales Director, Layton-Ross (Overseas) Ltd)

The Board took a bit of persuading, but J.M. had figures to back him. Look, he told them, we've a factory in South Wales and another on Clydeside, we've associates in Turin, Zurich, Dusseldorf, we've suppliers in Israel, Turkey, Iran. As for our clients, they're everywhere you can think of. With our executives spending most of their time shuttling to and fro between one and the other, this new plane will be an economy, not a luxury.

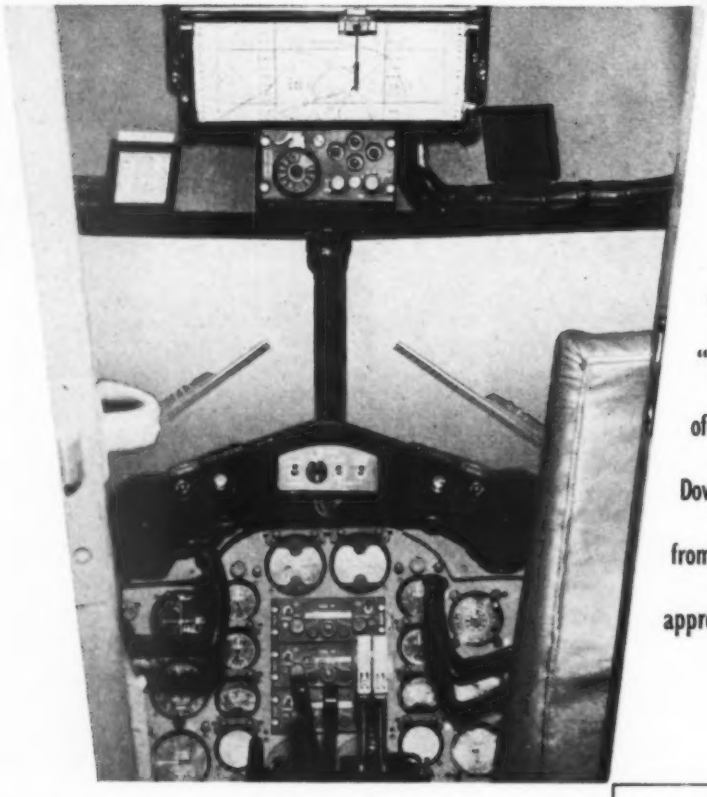
But why, one of the directors wanted to know, did J.M. propose they should buy it through UDT? Jack explained: it's the most convenient way. The purchase becomes a simple entry in the accounts, with only a small need for any capital outlay. A sensible way of doing things, the Board agreed.

UDT helps executives to fly themselves

UNITED DOMINIONS TRUST (COMMERCIAL) LIMITED · UNITED DOMINIONS HOUSE · EASTCHEAP · LONDON · EC3

MR. J. C. BAMFORD, Chairman and Managing Director of J. C. Bamford (Excavators) Ltd says:

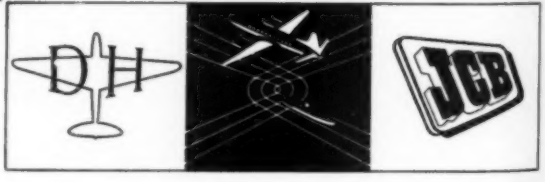
"We fitted Decca because we operate into many small, ill-equipped airfields all over Europe and we must be able to fly in any weather day or night, with the same regularity as from any major airfield".



Cockpit of the de Havilland Dove 8 owned by J. C. Bamford (Excavators) Ltd., showing the Decca Flight Log and Decometers. The installation consists of a Decca Mark 8 Receiver (½ ATR) and Computor (½ ATR), Flight Log and Receiver control boxes and display head, the total weight of all units being less than 45 lbs.

THE DE HAVILLAND AIRCRAFT CO. LTD., suppliers of the DOVE 8 aircraft, state:

"Decca is a proven system for the operator of executive aircraft such as the de Havilland Dove 8 who must frequently navigate away from airways and use airfields where approach facilities are often non-existent".



THE DECCA NAVIGATOR

for executive aircraft

THE DECCA NAVIGATOR COMPANY LIMITED LONDON

PRIVATE AND EXECUTIVE FLYING...

An Association of Business Users

In December last year, under the auspices of the Royal Aero Club, a steering committee was formed to organize the Business Aircraft Users Association, now about to be inaugurated. Open to all who use aircraft on business or who are connected with the aviation industry, and irrespective of whether a professional pilot is employed, the BAUA already has the support of a large number of firms, many of whose names are household words. Some of the Association's aims and objects are set out in this article. Wg Cdr Vigors is chairman of the Royal Aero Club's business aviation advisory committee and chairman-elect of the provisional BAUA sub-committee dealing with matters relating to flying and legislation. Sqn Ldr Ward is a business aircraft consultant.

WHEN import restrictions on foreign light aircraft were lifted in 1959, a veritable Pandora's box of light aircraft and equipment was opened to the British private aircraft owner. Many business men began to give serious consideration to this method of travel. It offered an alternative to slow railways and overcrowded roads, and to the inflexible and sometimes inconvenient schedules of trains and airliners. Some saw it as a means of improving the business efficiency of their organizations; others saw in executive aircraft an opportunity to expand their businesses, particularly in regard to exports.

On visits to the US and to other parts of the world many British businessmen had seen for themselves the advantages of private air travel on journeys which cut across established transport routes. The aircraft were small but fast, safe, and both comfortable and convenient.

A re-examination of business travel requirements in the United Kingdom showed that, although similar aircraft and equipment were freely available, ground facilities were not. Aerodromes had been closed with little regard for the needs of the private owner, and legislation introduced which ignored his existence. Private flying had been relegated to the status of an enjoyable but expensive sport.

By Wg Cdr TIM VIGORS and Sqn Ldr JOHN WARD

Despite this, a few business organizations with more appreciation than others of the possibilities of private air travel bought modern aircraft for use in connection with their businesses. From what they learned they became convinced that business aviation in this country—although beset by poor facilities and bureaucratic obstructionism—should be allowed opportunities for natural development.

It is in the London area that facilities for business aircraft are most lacking. Until recently, the only all-weather aerodrome regularly available to light aircraft was Gatwick. Thirty miles from the business centres of London, for journeys to the Midlands and North the airport is this distance and more in the wrong direction. Because it is geared to handle scheduled-airline passenger traffic, business aircraft are subject to more arrival and departure delays than they would be at an aerodrome intended to handle executive traffic.

Except in a few cases, such as when meeting passengers, most business owners do not want to use major airports. Slower piston-engined aeroplanes do not fit conveniently into jet traffic patterns and executive operators do not want to taxi a mile or more to the take-off point of a 5,000ft runway; they would be quite happy to use smaller airfields and landing strips nearer the starting point and destination.

The trouble is that all too often they are prevented from doing so. Regulation of controlled airspace seems designed to cater only for scheduled airline traffic. The other restriction is on Customs facilities; these are only available at major airfields, and are simply unobtainable at minor ones, even though the facility may not be very far away. Although quite willing to pay for special service, an executive operator must fly into a major airport—with inconvenience to all concerned—in order to get his passport and carnet stamped.

Although the Royal Aero Club is doing sterling work in the interests of the business operator, it has to represent the views of all private owners, and cannot give time to studying in detail the needs of one particular section. By their own efforts individual companies have managed to gain small concessions, but the major issues are usually beyond the scope of their influence. A central body was needed to collate the combined experiences and requirements of all business aircraft operators, powerful enough to represent leading commercial and industrial concerns as well as the small business. The Business Aircraft Users Association is to be formed to present this reasoned case, well supported by the collective experience of as many operators as possible. It should speak with a single powerful voice.

The first task of the Association should be to obtain an improvement in the airfield situation, particularly in the London area. What the owner of an executive aircraft wants is a small all-weather airfield open twenty-four hours a day, where his aircraft can be housed and serviced quickly and efficiently. Customs facilities should be available on request at reasonable notice, and the business aircraft operator should be able to leave his car, step into his aeroplane and be away with the minimum delay and fuss.

Croydon and Hendon aerodromes—both still in existence—are well suited for this purpose. Given permission for business aircraft to use them, the benefit to the individual, as well as eventually to the country as a whole, would be enormous.

This is a question of more than parochial importance. It is because the embryonic Association looks ten years ahead to a time when there might be 2,000 business aircraft in Great Britain that efforts are being made now to save these airfields. When the builders move in the opportunity will have gone for ever, and commerce will be the poorer as a result.

The Association's second task should be to obtain a more sympathetic official attitude to the use of business aircraft. This will involve an attempt to have present restrictive legislation and procedures reviewed and where possible revised. It will also involve the task of ensuring that the business operator—as represented by the Association—is consulted before any new legislation is put into effect. Previously there was no single body which could present the views of those interested in operating business aircraft.

Many other tasks will fall to the Association. Campaigning for the opening or continuance of suitable airfields or strips, negotiating with insurance companies, providing flight-briefing facilities, maintaining a register of crews and technical personnel, and liaising with the aircraft industry and other organizations are all intended to be part of the Association's duties.

The BAUA may also act as a centre for the collection and dissemination of information about such matters as, for instance, the availability of private landing strips. And, finally, it would give all possible assistance and impartial advice to those wishing to enter business aviation for the first time.

Many more growing pains must inevitably be suffered by business aviation in this country. Nevertheless, the future of this type of flying has never looked brighter. An increasing variety of aircraft and equipment, both foreign and home-manufactured, is becoming available. British businessmen—from chairman to junior executive—are waking up to the advantages of owning an aircraft. This powerful Association, now being formed, will provide a common voice for business users, and which can speak with sufficient influence to ensure a fair hearing from all Government departments. At long last England is set to catch up with the rest of the world in a sphere of aviation which is now one of national importance.

PRIVATE AND EXECUTIVE FLYING...

Why not a Business Aircraft?

By MAURICE CURTIS
and BRYAN GREENSTED
(Curtis Greensted Associates Ltd)

INCREASING interest is being shown by United Kingdom business houses in the use of aircraft to supplement, or even to replace, their normal transport. Yet the number of business aircraft in Britain is still probably under a hundred. Much greater efforts will have to be made to persuade business houses with executive travel requirements to look at the possibilities of using business aircraft before speculation as to the permanency of the current sales boom in American aircraft in Great Britain is resolved.

For businesses to be able to assess the economics and possible attractions of such operations, they must first understand the field such studies should cover. Answers are needed to such frequently asked questions as: What are the advantages and limitations of a business aircraft? What is its capital cost and operating costs? How should the right aircraft be selected and operated? Can business aircraft be economically operated other than by owning them? This article attempts to provide some answers.

Any type owned or hired by a businessman or a business house is a business aircraft. It is an aircraft owned by a company for the transport of its own executives and staff; but it also embraces aircraft and helicopters used for "aerial work"—e.g., agriculture, carriage of equipment, opening-up inaccessible areas, security patrols, power-line and pipe-line laying and inspection, fire-fighting, ambulance and flying doctor services, and aerial photography.

The majority of aircraft for executive travel are in the small single- and twin-engined category, with increasing emphasis on the twin-engined four/five-seater type. Appreciable numbers of larger twin- and four-engined aircraft of the smaller airliner type are owned by business houses throughout the world and specialized jets and turboprops are becoming available.

Many companies which do not have aircraft of their own make considerable use of charter. Provided it is not restricted by countries wishing to concentrate traffic on their international scheduled airlines, this type of operation could increase substantially.

But it is with executive aircraft that the biggest scope for expansion probably lies. In our definition this excludes company-owned aircraft flown by directors who are enthusiastic private pilots, when weather permits and when the particular trip attracts them.

Advantages and Limitations Although initial cost and operating costs are of first importance, these depend so much on individual assessment of the value of time saved that there is no point in looking at them in isolation. The special circumstances of each company are such that there is no real point in trying to assess the relative advantages of an executive aircraft to a particular firm by a generalized comparison of cost per seat per mile against other forms of transport. In most cases it will be higher. Some advantages can be assessed in terms of hard cash; others, being indirect benefits, can only be given an approximate cash value.

Three factors may offer a direct financial advantage: (1) faster transport of personnel or goods—although possibly at an increased specific transport cost per unit; (2) cheaper specific transport costs per unit resulting from advantageous use of an aircraft; or (3) the use of private air transport where no alternative exists.

Indirect advantages may be increased mobility, less wear and tear on executives, competitive sales benefits, public relations benefits, and so on, the value of which can only be assessed by the company itself. The prestige derived from operating a business aircraft is also often important.

Time saved through travelling by air will normally be a function of distance, that is, it will be greater over longer distances. There can, however, be substantial savings in time and effort over short distances where there are natural obstacles to direct surface communications such as sea, mountains or deserts.

For executive aircraft based within the United Kingdom, the most clear-cut savings in trip time arise when journeys have to be made between provincial points in the UK and similar points on the Continent or in Ireland. The further afield the journey the greater the saving in time and money. Between places not well connected by road or scheduled services, or where an itinerary includes points poorly served by road, surface or air transport, or even between centres of industry well served by surface transport, a business aircraft can show to advantage. Time saved depends upon the relation of airfields to points of departure and destination. It is also influenced by the type of aircraft used.

An executive aircraft can sometimes also offer advantages over scheduled air services if these are infrequent, or operate at unsuitable times of the day. But the greatest savings can be achieved by operating an executive aircraft to a schedule tailored to business appointments. For a meeting in London at 1530hr an executive team may, for example, have to catch a train from their home base at 0900, spend three hours travelling, and have to catch a return train at 1830. With a further three hours travelling this would be an elapsed time of twelve-and-a-half hours. Using an aircraft they could have two hours in the office and leave at 1100. After their meeting they could take off at 1730 and be back at their homes by 1930. Time elapsed would be eight-and-a-half hours, and four hours would be saved. Whether an aircraft is a sound proposition in this case depends upon the value of executives' time and the number of seats that are filled.

Some of the indirect advantages of a business aircraft have already been mentioned. Others are the short notice at which visits can be planned or changed, the facility with which alternative arrangements following a weather delay can be made to suit the company, and the encouragement of executives to travel further afield and to call at several points on one tour. This results in better use of senior man-power. Another advantage is that sales and negotiating teams can more easily travel together in privacy. Samples or documents are easily transported and can stay with the team, and most business aircraft are quiet enough for conversation to be conducted in a normal voice. The availability of transport at short notice is a competitive advantage; customers and prospects can be impressed by the use of such modern methods.

But there are limitations as well as advantages in the use of business aircraft in Britain; the size and location of airfields, limitations of navigational and landing aids and paucity of Customs and immigration facilities are all restrictive. Air traffic control requirements have to be met; and there is always the weather.

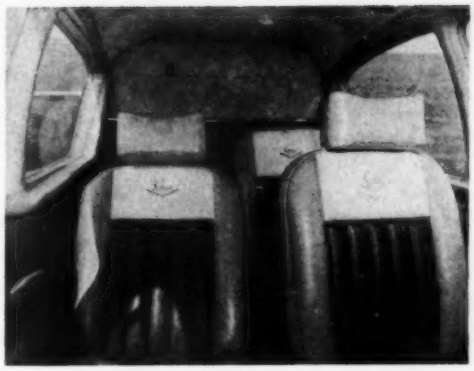
Since Croydon was closed London has had no public airport always open to business aircraft and within easy reach of its centre. But no one London airport could be located conveniently for all business aircraft users, and the twelve or so airfields around London usually enable direct routes to be selected between the city and a provincial or Continental terminal. These London airfields are not all open on a 24hr basis and are not equipped to enable business aircraft to operate as freely as the scheduled air services. But properly equipped aircraft can always divert to one of the major airports such as London, Gatwick, Stansted or Southend. Better facilities for business aircraft in the London area are also anticipated.

In the provinces, the position varies considerably, but although there are obviously not yet enough airfields, few major industrial areas do not have one or more airfields within reasonable reach.

Many concerns located away from densely populated areas may find it possible to construct and share their own grass landing strips. Although all-weather night and day operations would not be possible, these strips can be used as a satellite to the nearest properly equipped airfield.

With interest in business aviation growing, and plans afoot for the production by the BEAGLE consortium of a new range of aircraft, it is to be hoped that the Government will give priority to the improvement of facilities for business flying; and that municipalities will not concentrate on future helicopter possibilities to the exclusion of adequate facilities for fixed-wing business aircraft.

Capital and Operating Costs The capital cost of an aircraft will naturally depend upon the type selected. Each company must decide between a single or a twin, and on the number of seats and degree of luxury required, and upon likely radius of operation. The following table gives an indication of capabilities and costs.



"Each company must decide . . . upon the number of seats and the degree of luxury required." Left, pilots' and passengers' seats in the Piper Aztec and, right, a pair of executive seats in a de Havilland Dove 8

Type	No of engines	Pass. seats	Cruise speed (m.p.h.)	Max. range (st mi)	Range at which all seats can be used * (st mi)	Total weight (lb)	Equipped price, new† (£)
A	1	3-4	130	760	500	2,400	7,000
B	1	4	165	1,100	570	2,900	12,000
C	2	4-5	160	1,200	1,200	3,800	25,000
D‡	2	4	205	1,450	1,050	4,830	35,000
E‡	2	5	200	1,000	1,000	7,700	70,000
F‡	2	5	170	875	875	8,950	52,000
G‡	4	8	175	1,550	1,400	13,500	70,000

* 165lb + 20lb baggage per passenger. † Radio and navigation equipment included. ‡ Professionally flown, pilot not included in passenger seat figures.

While these costs are for new aircraft, good second-hand ones are often obtainable at substantially lower prices.

Revenue allowances on first cost are substantial. There is an investment allowance of 20 per cent, an initial allowance of 10 per cent, and 20 per cent is allowed on depreciation. Depending upon maintenance arrangements, probably not more than 10-15 per cent of first cost need in any case be allowed for spares. Operating costs depend ultimately on flying hours and hence upon the spread of fixed costs. The examples given below are for the aircraft in the table above utilized at 600hr per annum.

Fixed Annual Costs (£)	Category of Aircraft A	B	D	E
Depreciation (10 per cent p.a.) ...	700	1,200	3,500	7,000
Insurance	455	720	2,275	2,993
Pilot	—	—	2,040	2,170
Hangarage...	107	110	110	337
C of A	60	85	375	—
Landing card	8	10	—	—
Total (£)	1,330	2,125	8,300	12,500
Cost per hour (£)	2.21	3.54	13.83	20.68
Hourly Direct Costs (£)				
Fuel (inc. UK duty and oil)	1.8	2.51	4.68	6.92
Airframe maintenance	0.7	0.82	1.05	2.0
Engines and prop maintenance ...	0.5	0.75	1.5	2.4
Landings	—	—	1.5	2.4
Cost per hour (£)	3.0	4.08	8.73	14.32
Total hourly operating costs (£)	5.21	7.62	22.56	35.00
Block speed (m.p.h.)	120	165	205	200
Cost per mile (pence)	10.5	11	26	42
Cost per passenger mile (all seats occupied) (pence)	3.5	3	6.5	8.5
Miles per annum	72,000	99,000	123,000	120,000
Cost per annum (£)	3,100	4,600	13,500	21,000

NOTE: The above figures include UK duty on fuel. Hourly fuel costs are approximately halved for external flights.

Thus, if full use is made of the available seats, costs per passenger mile range between, say, 3d and 9d. Typical seat-mile costs for first-class travel by other means are: UK internal air services 5d-6d; rail 3¼d-4d; short-haul international air services, 11d; and long-haul international air services, 8d-10d.

Finding the Right Aeroplane Selection of the right type of aircraft is fundamental to successful operation. For this it is necessary to examine whether journeys are principally short-distance or long distance, how many passengers normally travel together and whether there are special requirements in regard to internal layout. It is also important to decide whether night and all-weather operation is necessary, and whether a single-engined or twin-engined aircraft is desirable or essential.

The aircraft short-listed must be able to use all the desired airfields and it should be equipped to achieve the right intensity of operation. It must be demonstrated that initial cost is within capital limits imposed by the company, and that any particular type, taking the location of its base into account, will be easy to maintain.

There is no doubt that a twin-engined aircraft gives greater regularity and can be operated from properly equipped airfields under more adverse weather conditions than a single. But modern engines are so reliable that if lack of flexibility in unfavourable weather can be accepted, the right single-engined aircraft can provide very good service. It is also often considerably cheaper to operate per seat-mile than twin-engined aircraft.

It should be decided whether the aircraft will be operated by a qualified company executive or by a professional pilot. If staff will be required to fly in the aircraft then they should be assured of a standard of operation similar to that applied to the public air services; it must be certain that any company executive who flies the aircraft has adequate experience.

Another simple but necessary operational control is the establishment of weather minima suitable to the aircraft and the experience of the pilot. There should be regular checks that the latter is adhering to these and that he is receiving practice in a Link trainer.

From maintenance can arise the widest variations in operating costs, since it is upon this that safe and efficient operation of the aircraft is so dependent. If only one or two aircraft are involved, it is often more economic to subcontract major maintenance. The decision depends on the location of the base and the maintenance facilities that are already available there. If maintenance facilities are offered by the aircraft manufacturer, it could well be convenient for the operator to take advantage of them. Similarly an "over-the-counter" spares service offered by the manufacturer or by an approved maintenance contractor, and the intensity and range of operation, also have a bearing on the maintenance decision.

In practice the optimum combination of maintenance, reliability and economy is usually best achieved by using a professional concern to organize maintenance, to negotiate contracts, and control standards and costs. Where the carriage of people is involved there can be no compromise with safety.

Companies in need of a twin with six or more seats and space for comprehensive equipment may find that de Havilland's new Dove 8 just fits the bill. It is one of the few small aircraft in which provision is made for a toilet

PRIVATE AND EXECUTIVE FLYING . . .

CLUB PILOT'S CHECKLIST

Costs, Clubs, Airfields, Aircraft, Events

WHERE can I learn to fly and how much will it cost? These questions, it is obvious from *Flight's* weekly correspondence, are the most basic of the many queries posed by would-be private pilots. In this country, the respective answers are "Almost anywhere" and "A lot of money." So much for basic principles; now for details.

Flying clubs, schools and groups which are members of the Association of British Aero Clubs or the Popular Flying Association are listed, together with their home bases, on the opposite page. In general terms the flying schools and air centres concentrate on flying instruction and aircraft hire, the clubs are those which include also a social programme, and the groups comprise syndicates who in many cases reduce costs by personally carrying out routine maintenance and other chores.

The best way for a prospective pupil to determine the cost of learning to fly is simply to go out to an aerodrome, get hold of the chief flying instructor of the appropriate club, school or group, and ask him. To assist prospective pupils, however—and perhaps their CFIs—the following typical rates may be of interest. At clubs in the London area the cost of one hour's dual instruction can be £4 10s (Auster), £5 (Tiger Moth, Piper Cub or Cessna 150), £6 (Chipmunk), or £7 (Prentice or Caribbean). In certain clubs solo training for the Private Pilot's Licence is 10s per hour cheaper, and post-PPL solo can be 10s cheaper still.

Further afield, Tiger Moth and Auster flying can be as cheap (relatively speaking) as £3 12s 6d per hour, and Chipmunks can be £5 5s. "Contract" rates for a block of, say, 50 hours can reduce this to £2 17s 6d for Tigers and Austers. Even in areas blessed by the London cost of living, contract rates can effect a reduction of 5, 10 or 12½ per cent.

How many of these expensive hours are needed to gain a Private Pilot's Licence? At least 30, and probably nearer 40—or more, if the overall training period is a long one. Total flying costs can be calculated from the above figures according to the locality, or can be consulted in *Flight's* dissertation on *The British Scene* in last year's Sport and Business Flying issue (March 25, 1960), bearing in mind the increase in flying rates since that date. For experienced glider pilots, the number of power-flying hours required is reduced.

Additional expenses will include an annual club subscription of four or five guineas, and in some cases an entrance fee of another guinea. A Student's Licence will cost 10s, the medical examination about a guinea (depending on the doctor) and, upon completion of the PPL course, the newly fledged pilot is privileged to pay another 10s to a grateful Ministry for the actual piece of paper which proves his achievement.

Other costs can vary widely. Helmet, goggles, massive layers of protective clothing and flying boots would perhaps look out of place in the cabin of a Caribbean, but not in a Tiger. The club might have a well-stocked library, or you might have to buy some books to conceal or correct your ignorance. Lectures on PPL subjects might be organized and costly, or disorganized and free. Transport costs to the aerodrome might depend on whether you walked, caught a bus, or drove Dad's second Bentley—and conceivably on the distance involved.

In case of queries on the official regulations involved in obtaining a Private Pilot's Licence, contact the Aviation Safety and General Division, SA(L)5, Room 210, Ministry of Aviation, Shell-Mex House, London WC2.

Before and after obtaining your PPL, you can obtain the advice and assistance of the three organizations concerned with private and club flying in this country. To benefit to the full, one can pay two guineas to become an independent member of the Association of British Aero Clubs and Centres (7c Lower Belgrave Street, London SW1); two guineas to become an associate member of the Royal Aero Club (Londonderry House, Park Lane, London W1); and £2 to become an individual member of the Popular Flying Association (also at Londonderry House). Details of their own particular benefits will be supplied with pleasure by each of the three bodies.

What does this year's sporting calendar have to offer the enthusiast private pilot? Apart from local club events, it includes the following:—

April 28-30, Shackleton Aviation Weekend, Baginton; May 5-7, Channel Islands International Air Rally, Jersey; June 2-3, London-Cardiff Air Race and short-circuit races, Panshanger and Rhoose; June 24-25, La Baule Rally; July 1-2, Deauville Rally; July 13-15, King's Cup race and Lockheed Aerobatic Competition, Baginton; July 27-29, Business and Touring Aircraft Competition, Kidlington.

His appetite whetted by the sight of other people racing, touring, aerobatting and in general having fun in light aircraft, our enthusiast needs only one further incentive—money—to buy his own aircraft and really get with this thing they call flying. Assuming his keenness is eventually matched by what the Americans might call an adequate financial capability, he is free to consult pages 368-374 of this issue and make his choice. In this, as in learning to fly, he may well be helped by United Dominions Trust, whose learn-to-fly scheme was worked out together with the ABAC and was introduced to the club movement last year.

Although full details of specific types of new aircraft can normally be obtained from the manufacturers, agents or distributors, it is often useful to have an impartial assessment of relative merits, particularly when used aircraft are involved. In this the advice of reputable aircraft brokers, such as W. S. Shackleton (Aviation) Ltd (175 Piccadilly, London W1) and R. K. Dundas Ltd (59 St James's Street, London SW1), can be most valuable. The practical example of Shackleton's own aviation weekend, first at Kidlington and now at Baginton, has become recognized as an important annual event.

Even when the aircraft of our dreams has been selected, agreed with the wife, financed and secured, our troubles are not over. The problem of maintenance and servicing remains. Here one can either depend on the club or aerodrome facilities where the aircraft is normally based, or use such "fly-in" facilities as the expanding private and business aviation centre run by McAlpine Aviation at Luton or that of Derby Aviation at Burnaston, Derby. In the London area, improved facilities at Panshanger and Biggin Hill are helping to fill the gap left by the closure of Croydon.

Flying Clubs and Groups in the United Kingdom

Compiled from the membership lists of the Association of British Aero Clubs and Centres, and of the Popular Flying Association. Overseas clubs, and a full list of firms' clubs, are not included

ABAC MEMBER CLUBS

Bristol and Wessex Aeroplane Club, *Bristol*
Cambridge Aero Club, *Cambridge*
Cheltenham Aero Club, *Staverton, Glos*
Christchurch Aero Club, *Christchurch, Hants*
Coventry Aeroplane Club, *Baginton, Coventry*
Cumberland Flying Club, *Crosby, Carlisle*
Denham Flying Club, *Denham, Bucks*
Derby Air Centre, *Derby*
Elstree Flying Club, *Elstree, Herts*
Exeter Aero Club, *Exeter*
Fair Oaks Aero Club, *Fair Oaks, Surrey*
Glamorgan Flying Club, *Rhoose, Glam*
Hampshire Aeroplane Club, *Eastleigh, Southampton*
Herts and Essex Aero Club, *Stapleford Tawney, Essex*
Isle of Wight Air Centre and Flying Club, *Sandown, IoW*
Lancashire Aero Club, *Barton, Manchester*
Leeds/Bradford Air Centre, *Yeadon*
Leicestershire Aero Club, *Leicester East*
Luton Flying Club, *Luton, Beds*
Midland Aero Club, *Elmdon, Birmingham*
Newcastle-upon-Tyne Municipal Flying School and Air Centre, *Woolsington, Newcastle*
Norfolk and Norwich Aero Club, *Swanton Morley, Norfolk*
Northamptonshire Aero Club, *Sywell, Northampton*
Oxford Aeroplane Club, *Kidlington, Oxford*
Plymouth Aero Club, *Plymouth*
Portsmouth Aero Club, *Portsmouth*
Rochester Flying Club, *Rochester, Kent*
Scottish Aero Club, *Perth*
Sherwood Flying Club, *Tollerton, Nottingham*
Skegness Aero Club, *Ingoldmells, Lincs*
Southend-on-Sea Municipal Air Centre and Flying School, *Rochford, Southend*
Southern Aero Club, *Shoreham, Sussex*
Surrey and Kent Flying Club, *Biggin Hill, Kent*
Ulster Flying Club, *Newtownards, County Down*
West London Aero Club, *White Waltham, Berks*
Wiltshire Flying Club, *Thruxton, Hants*
Wolverhampton Aero Club, *Wolverhampton*
RAF College Flying Club, *Cranwell North*
Royal Artillery Aero Club, *Christchurch, Hants*
Airways Aero Club, *White Waltham, Berks*
London Transport (CRS) Sports Association Flying Club, *Fair Oaks, Surrey*

ABAC ASSOCIATE MEMBER CLUBS

Blackpool and Fylde Aero Club, *Squires Gate, Blackpool*
Colchester Flying Club, *Boxted, Essex*
Cotswold Aero Club, *Staverton, Glos*
East Anglian Flying Club, *Ipswich, Suffolk*
East Yorkshire Aero Club
Edinburgh Flying Club, *Turnhouse, Edinburgh*
Grimsby Flying Club, *Waltham, Lincs*
High Wycombe Air Station Aero Club, *Booker, Berks*
Liverpool Flying Group, *Liverpool*
Maitland Drewery Flying Club, *Biggin Hill, Kent*
Northern School of Aviation Flying Club, *Squires Gate, Blackpool*
Shropshire Flying Group, *Sleap, Salop*
Swansea and District Flying School and Club, *Swansea*
Turnhouse Air Centre, *Turnhouse, Edinburgh*
Vendair Flying Club, *Biggin Hill, Kent*
Warwickshire Aero Club, *Elmdon, Birmingham*
Alouette Flying Club, *Biggin Hill, Kent*
Experimental Flying Group, *Biggin Hill, Kent*
Isle of Man Flying Club, *Ronaldsway, IoM*
Air Touring Club, *Biggin Hill, Kent*
Allied Flying Group, *Woolsington, Newcastle-upon-Tyne*
Alpha Mike Flying Group, *Thruxton, Hants*
Avon Flying Group, *Seend (private field), Wilts*
Bircher Flying Group, *Wolverhampton*
Doncaster Flying Group, *Doncaster*
Douglas Holland Flying Group, *Elmdon, Birmingham*
Easy King Flying Group, *Sywell, Northants*
Falcon Flying Group
Highfield Flying Group, *Wolverhampton*
High Wycombe Flying Group, *Booker, Berks*
Hornet Moth Flying Group, *Denham, Bucks*
Magister Flying Group, *Denham, Bucks*
Maitland Drewery Flying Group, *Biggin Hill, Kent*
Middlesex Flying Group, *Elstree, Herts*
North Waltham Flying Group, *Thruxton, Hants*
North West Flying Group, *Limavady, N. Ireland*
Panda Flying Group, *Luton, Beds*
Puss Moth Flying Group, *Biggin Hill, Kent*
RKS Flying Group, *Fairwood Common, Swansea*
Rhoose Flying Club, *Rhoose, Glam*
Roberts Eagle Flying Group, *Elstree, Herts*
St Edward's Group, *Kidlington, Oxford*
Severn Lamb Flying Group, *Edgehill, Oxon*
Shirley Flying Group, *Birmingham*
Southdown Flying Group, *Wellcross Grange Fields, Sussex*
Spartan Flying Group, *Denham, Bucks*
Stoke-on-Trent Flying Club, *Meir, Staffs*
Streatham Flying Club, *Denham, Bucks*
Thirty-Two Group, *Wolverhampton*
Tiger Club, *Redhill, Surrey*
Waveney Flying Group, *Seething, Norfolk*
Willie Jig Flying Group, *Lulsgate, Somerset*
Central Flying School Flying Club, *Little Rissington, Glos*
Defford Aero Club, *Defford, Worcs*
Household Brigade Flying Club, *White Waltham, Berks*
RAF Chivenor Flying Club, *Chivenor, N. Devon*
RAF Station Wethersfield Aero Club, *Wethersfield, Essex*
APT Flying Club (*Works club, Byfleet, Surrey*)
Upper Heyford Chapter SAC Aero Club, *Upper Heyford, Oxon*
Auster Flying Club, *Rearsby, Leics*
de Havilland (Chester) Flying Club, *Broughton, Cheshire*
Derby Airways Flying Group, *Derby*
Fairey Flying Club, *White Waltham, Berks*
Merlin Flying Club, *Derby*
Propellers Flying Group, *Hatfield, Herts*

PFA CO-OWNERSHIP GROUPS AND CLUBS

Cardiff Ultra-Light Aeroplane Club, *Rhoose, Glam*
Montgomeryshire Ultra-Light Flying Club, *Heldre Hill, Welshpool*
Cambridge Private Flying Group, *Cambridge*
Armstrong Siddeley Flying Club, *Baginton, Coventry*
Biggin Hill Flying Club, *Biggin Hill, Kent*
MPM Flying Group, *Elstree, Herts*
TK Flying Group, *Hatfield, Herts*
Biggleswade Flying Group, *Panshanger, Herts*
Ruthergien Group, *Streathavon (private field), Glasgow*
Carnegie Flying Group, *Luton, Beds*
Albatross Flying Group, *Denham, Bucks*
Stapleford Flying Group, *Stapleford Tawney, Essex*
Swallow Flying Group, *Elstree, Herts*
Warwickshire Flying Group, *Elmdon, Birmingham*
Roberts Eagle Flying Group, *Elstree, Herts*
East London Flying Group, *Stapleford Tawney, Essex*
Old Warden Flying Group, *Biggleswade, Beds*
Herriard Flying Group, *Lasham, Hants*
Sir Armstrong Whitworth Flying Group, *Baginton, Coventry*
Southport Aero Club, *Hesketh Park, Lancs*
North Norfolk Flying Group, *Fakenham, Norfolk*
Aldenham Private Flying Group, *Elstree, Herts*
Lincoln Aero Club, *Kirton Lindsey, Lincs*
Birmingham Airport Flying Group, *Elmdon, Birmingham*
Cornish Private Flying Group, *Perranporth, Cornwall*
Cornish Gliding & Flying Club, *Perranporth, Cornwall*
RAF Syerston Flying Club, *Syerston, Notts*
Hertfordshire Police Flying Club, *Panshanger, Herts*
Silverline Flying Group, *Eastleigh, Southampton*
PFA Group 100, *White Waltham, Berks*
Daedalus Flying Group, *Lasham, Hants*
Fox Easy Flying Group, *Lasham, Hants*
604 Sqn Flying Group, *Honington, Suffolk*
Mill Hill Group, *Elstree, Herts*
Bustard Flying Club, *RAF Boscombe Down and Old Sarum*
Ulster Aeroplane Group, *Sydenham, Belfast*
McAully Flying Group, *Little Snoring, Norfolk*
Great Easton Flying Group, *Stansted, Essex*
Denham PFA Group, *Denham, Bucks*
Air Touring Group, *Luton, Beds*
Belfast Airport Flying Group, *Belfast*
600 Sqn (City of London) Flying Club, *Biggin Hill, Kent*
Yorkshire Territorial Flying Club, *Yeadon, Yorks*
Blackpool & Fylde Aero Group, *Squires Gate, Blackpool*
Double-Alpha Flying Group, *Liverpool*
Tiger Club, *Redhill, Surrey*
615 Sqn Flying Group, *Biggin Hill, Kent*
Butterfield Flying Group, *Stapleford Tawney, Essex*
Bolton Flying Group, *Barton, Manchester*
Humber Flying Group, *Skegness*
Rollason Flying Group, *Biggin Hill, Kent*
Hornet Private Flying Group, *Luton, Beds*
Hadrian Group, *Woolsington, Newcastle-upon-Tyne*
Winkfield Flying Group, *White Waltham, Berks*
Yorkshire Flying Group, *Sherburn-in-Elmet, Yorks*
KK PFA Group, *White Waltham, Berks*
GEC (Coventry) Flying Group, *Baginton, Coventry*
Prestwick Aero Club, *Prestwick, Scotland*
Bournemouth Flying Group, *Christchurch, Hants*
Royal Engineers Flying Group, *Rochester, Kent*
Thruxton Flying Group, *Thruxton, Hants*
West Lancs Flying Group, *Speke, Liverpool*
Gower Flying Club, *Rhoose, Glam*
Welwyn Flying Group, *Panshanger, Herts*
Jedburgh Group, *Kelso (private field), Scotland*
Perseus Flying Group, *White Waltham, Berks*
Marwood Flying Group, *Barton, Manchester*
RAF Waddington Flying Group, *Waddington, Lincs*
Coningsby Flying Group, *Coningsby, Lincs*
Brooklands Flying Group, *Barton, Manchester*
Southwell Air Touring Club, *Tollerton, Nottingham*
PFA Group 172, *Old Sarum, Wilts*
FK Flying Group, *Stapleford Tawney, Essex*
Manchester Flying Club, *Manchester*
RAF Chivenor Flying Club, *Chivenor, Devon*
York & District Flying Club, *Riccall, Yorks*
Southampton Group, *Eastleigh, Southampton*
Worcester Aero Club, *Worcester*
Hemswell Flying Group, *Hemswell, Lincs*
Proctor Group, *Baginton, Coventry*
Solent Flying Club, *Eastleigh, Southampton*
Bristol Channel Flying Group, *Swansea Airport*
Garke Group, *White Waltham, Berks*
Falcon Air Touring Club, *Leicester East*
Bourne & District Flying Group, *Falkingham*
Tipsy Flying Group, *Baginton, Coventry*
Woking Flying Group, *Redhill, Surrey*
Lotus Flying Group, *Panshanger, Herts*

PRIVATE AND EXECUTIVE FLYING...

Aircraft in Prospect

THE BEAGLES ARE COMING

By PETER MASEFIELD

BRITISH Executive and General Aviation Limited (BEAGLE) was formed on October 7 1960 in the endeavour first to put British light aircraft back into the prominent place in world aviation which they occupied before the War and, second, to achieve for the United Kingdom in both home and export markets a new generation of advanced modern business aircraft in this specialist category. BEAGLE's objectives are thus to design, develop and build in quantity a new range of British light and executive aircraft for personal, club and business use. In this task, we of BEAGLE enjoy—and that is the right word—the support and backing of the Pressed Steel Co Ltd of Cowley, Oxford, of which BEAGLE is a subsidiary.

During the past few months two further steps forward have been achieved. Both Auster Aircraft Ltd of Rearsby, Leicester, and F. G. Miles Ltd of Shoreham, Sussex, are now wholly-owned subsidiaries of British Executive and General Aviation. Both companies will retain their identities within the BEAGLE Group—and the famous name of Miles Aircraft Ltd re-emerges in a new form under BEAGLE auspices. The BEAGLE Group thus now comprises three operating units: British Executive and General Aviation Ltd, BEAGLE-Auster Aircraft Ltd and BEAGLE-Miles Aircraft Ltd.

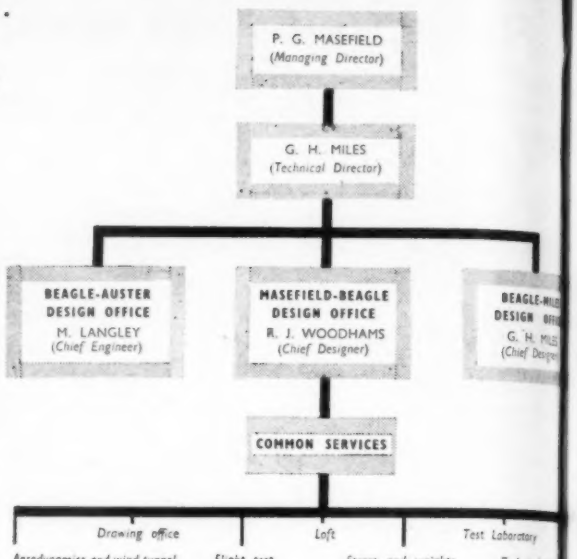
A word here may be appropriate about the background of the new organization and enthusiasms which will, if all goes well, fill a gap in British aircraft production which has become increasingly obvious in recent years.

When the great industrial mergers came about in British aviation in the early part of 1960, an opportunity presented itself to take a fresh look at the specialist possibilities of a new approach to British light aeroplane endeavour. And so it was that, during the summer of 1960, I found myself engaged in discussion with two forward-looking believers in business aviation who are, also, widely experienced in manifold industrial affairs. With these two, Mr M. A. H. Bellhouse, deputy chairman of the Pressed Steel Co Ltd, and Mr J. R. Edwards, managing director of Pressed Steel, together with Mr Alex Abel Smith, chairman of Pressed Steel, the idea was developed. The blessing of both the Ministry of Aviation and the SBAC was received to form a new company.

The result has been BEAGLE, which, like Aero Design, Beech, Cessna, Piper and Mooney in the USA, will specialize in one task—developing a range of modern, light and business aircraft.

The name BEAGLE was evolved after much cogitation. In the end it says the things we have in mind—"British" first, then "Executive and General Aviation." And the first three letters "BEA" have, for me, a nostalgic ring and association about them! Strictly the name should spell "BEAGAL"—but "poetic licence" in spelling must be allowed in order to maintain the tenets of elegant English. And, as one old book on hounds has it—BEAGLES are distinguished for their "good manners, obedience to command, their handle-ability and for their enthusiasm for the tasks to which they are set. They have a special form of good looks of their own. They are a breed which, when appreciated, command affection." There is a reputation to live up to! Certainly there is no shortage of aeronautical hares to chase.

So here we stand, at the threshold of a new enterprise, with a close alliance, on the one hand, with new friends and colleagues of a great industrial concern—Pressed Steel—in which resides widespread production "know-how" combined with enthusiasm for new realms—and, on the other, a no less close alliance with old friends at Miles and Auster, now joined together to form the BEAGLE Group. An important—and indeed essential—further step forward has been the Rolls-Royce decision to build in England a range of advanced light aero engines under licence from Continental Motors of the USA. "Powered by Rolls-Royce" will be a future BEAGLE cachet.



What about BEAGLE products? As yet it is too early to announce specific types. The motor-car industry's practice of refraining from shouting its wares until these are in "the shop window" has a great deal to commend it in a highly competitive international field.

This much can be said. The BEAGLE policy will be to concentrate upon three broad lines of development, within the one family of BEAGLE types. These will be:—

The BEAGLE-Auster range of high-wing aeroplanes which will be developed, initially, from the long-standing Auster range, which has been almost the sole continuing representative of British light aircraft production since the War.

The Masefield-BEAGLE range of specialist, and somewhat larger, executive, communications, advanced trainer and business aircraft, and

The BEAGLE-Miles range of low-wing types which will take forward, in modern form, from where the faithful Messenger and Gemini left off some years ago.

Between them, the BEAGLE Pack will be aimed to cover the sporting, touring and business aircraft spectrum, from two-seats upwards. How far upwards remains to be seen—and decided. There are also, of course, possibilities of military counterparts, among which the BEAGLE-Auster Mark 9 is in continuing service and production for the British Army.

We believe that there is a tremendous future for the right types of aeroplane in business and sporting flying, as well as an increasingly valuable means of personal transport and military liaison. This is an aspect of aviation which, as yet, has hardly begun.

What we believe also is this. Building light and business aircraft to meet world-wide competition is a specialist job—specialist on product, specialist on production methods, on flying operations, on internal trim and styling, specialist on pricing policy and specialist on sales attack. The BEAGLE-Pressed Steel-Auster-Miles-Rolls-Royce approach combines many specialist things—against a certain background of experience on aeronautical, automobile, light aircraft and aero-engine requirements and practices.

Our specialist approach also includes a policy of seeking the benefits of the advice, imagination and experience of people such as Professor Misha Black of the Design Research Unit (on styling and aesthetic aspects), Professor A. D. Young of Queen Mary College (on aerodynamic refinement), the RAF at Farnborough and Bedford (on many aspects of advanced aeronautical thinking) and of Pressed Steel itself (on detailed production methods and the application of motor car techniques). We are also grateful for the advice and help extended from the ARB, the Guild of Air Pilots, the British Air Line Pilots Association, and many others.

In the end it will be the products which will count—their technical merit, their customer appeal, their flying characteristics, their competitive price and, of course, their cost to produce.

The BEAGLE endeavour will be to produce quality at competitive cost. We intend to set major emphasis on comfort, on handleability, on integrity of structure, on completeness of equipment, on maintenance characteristics and on good aesthetic design. The first of the litter—"by BEAGLE out of Auster"—should be on view quite shortly, with the more sophisticated business aircraft not so far behind.

"The BEAGLES are coming"—and before long we intend that they shall be in full cry.

ALSO NEW FROM BRITAIN

D.H.125 *de Havilland Aircraft Co Ltd, Hatfield, Herts*

AN announcement that de Havilland were considering manufacture of an executive jet was made by the company's managing director, Mr H. G. Sturgeon, in January. This confirmed earlier reports of de Havilland's interest in a jet successor to the Dove. Similarly, it is rumoured that prototype D.H.125s are already being built, although no announcement to this effect has yet been made.

The D.H.125 is to be powered by new Bristol Siddeley Vipers developed from the ASV.12; these might be the ASV.20 type, a straight-jet of 3,240lb thrust and weighing 575lb, or another Viper derivative, the P.209, with a thrust rating of 3,000 to 3,830lb. One of the main attractions of de Havilland's baby jet is believed to be low first cost; one business operator has said already that an order will be placed as soon as possible.

E.S.1 Tutor, E.S.2 Paragon *Wiltshire School of Flying, Thruxton Aerodrome, Andover, Hants*

UNDER development by the Wiltshire School of Flying now are two basic aircraft for training, touring or club use, the two-seater E.S.1 Tutor trainer and four-seater E.S.2 Paragon. Both are aerobatic. Since they were first announced in February 1959 the designs have been modified to meet MoA specifications (see page 365). Details were given in *Flight*, February 17, 1961.

Both aircraft embody a unique form of fuselage construction—Warren truss girders prefabricated from tube or stamped from sheet. It is claimed that assembly and maintenance can be carried out largely with unskilled labour and that the cost of construction is only three-quarters that of contemporary types. Maintenance and overhaul are also said to be necessary at less frequent intervals than with current light aircraft.

Progress is at present delayed by financing problems, but negotiations are taking place with two manufacturers in Great Britain, one in Switzerland and another in Canada, with a view to producing the aircraft in quantity. The Tutor, equipped with either a 140 h.p. Lycoming 0-290 or a 145 h.p. Continental 0-300, should retail at about £2,500 and the Paragon (175 h.p. Continental or 180 h.p. Lycoming 0-360) at about £2,900.

Halcyon *Hampshire Aeroplane Club, Eastleigh Airport, Hants*

PROTOTYPE of an all-wooden four-seater, the Halcyon twin, may fly from Eastleigh within three months. Power is provided by two 105 h.p. Walter Minors. Design cruising speed is 150 m.p.h. and rate of climb should be over 1,500ft/min. The intention has been to build the smallest possible twin at the lowest possible price—span is 31ft 4in, length 23ft 6in and price should be under £5,000.

If the aircraft is successful a further 12 will be laid down and later Rover gas turbines may be installed. A photograph appears on page 359.

Tawney Owl *Thurston Engineering, Stapleford Tawney Aerodrome, Essex*

ALTHOUGH the prototype Tawney Owl (75 h.p. Porsche Type 678/4) met with misfortune on its first flight on April 22 last year, when it nosed over and was damaged, the project is continuing and repair work is complete except for fins, booms and rudders. The accident is said to have been due to lack of power and an unsuitable propeller. About two to three months work remains to be done before the Owl could fly again, but this is unlikely to be tackled before next winter.

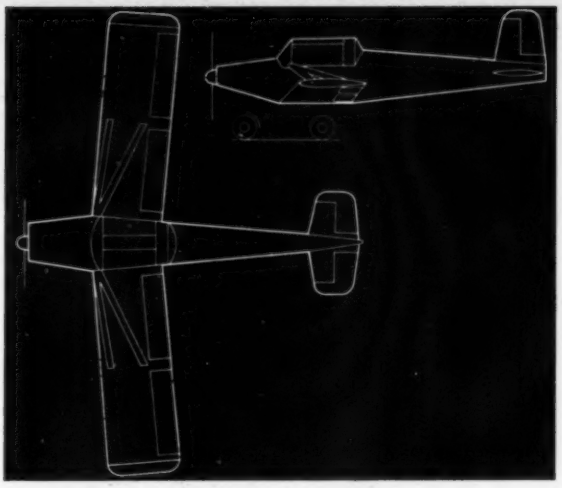
NEW FROM ABROAD

Skymaster *Cessna Aircraft, Wichita, Kansas, USA*

AS expected, Cessna's formula for a twin that "is as easy to fly as any single" is a twin-boom four-seater with both pusher and tractor power units. What these are has not yet been revealed, but there seems no reason why a range of engines should not be installed. While asymmetric flight problems cannot arise with a push-pull configuration, Cessna may have had to be prepared to accept, in the interests of safe single-engined operation, slightly less smoothness and quietness than with a conventional twin. The boom layout may also result in a slight weight penalty. Nevertheless, this is the most interesting aircraft for years to come from America's largest manufacturer of light aircraft.

MFI-Junior *Malmö Flygindustri Aktiebolaget, Bulltofta Flygplats, Malmö, Sweden*

PROTOTYPE of the 24ft span Junior, the BA-7, was designed and built in the US by Mr B. Andreasson, group engineer at Convair, San Diego. When he returned to Sweden last October, Mr Andreasson had done all the development flying himself. He is now at work on production versions. Three production prototypes with 100 h.p. Continental 0-200 engines will fly this summer and an initial batch of ten will be available at the end of the year. An all-metal two-seater, the Junior will be offered for sale in the US. It has an astonishing performance for its power—cruising speed is said to be 140 m.p.h. and sea level rate of climb 1,000ft/min.



Wiltshire School of Flying E.S.1 Paragon

SAAC 23 *Swiss American Aviation Corporation and Aviation Development Inc, St Gall, Switzerland*

TWO major factors have governed the development of this executive jet. In the first place it is argued that, because 90 per cent of all business aircraft journeys are under 1,000 miles, a jet which cruises at 500 m.p.h. can be made quite small. Span of the SAAC 23 is 33ft and length 37ft, but there is accommodation for up to seven passengers (some sitting sideways-on) with 260lb baggage. Secondly, SAAC believe that a small jet could be flown by one competent, non-professional, private pilot, although it would clearly be necessary for this pilot to be instrument qualified.

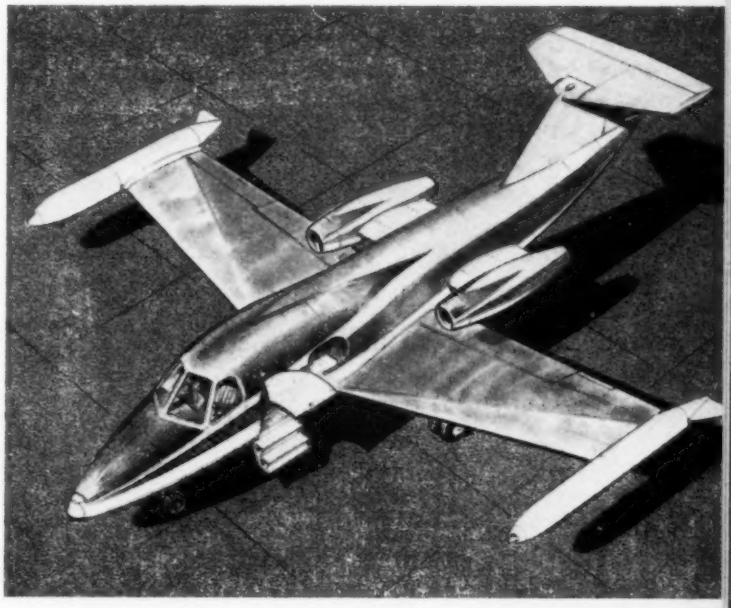
As indicated in *Flight*, January 27, 1961, control of the design is under the personal direction of Mr William P. Lear, chairman of Lear Inc. The basic airframe will be subcontracted in Europe and, when assembled, shipped to the USA for installation of the two General Electric CJ610-2B turbojets.

Performance is exceptional; max TAS on max continuous thrust at 10,000ft is 610 m.p.h. Cruising speed at 30,000ft and 90 per cent max continuous thrust is 500 m.p.h. Fully loaded to a weight of 11,200lb, rate of climb at sea level is 6,000ft/min. Theoretical range at 40,000ft with 45min holding is 2,270 miles.

An attraction of the SAAC 23 should be its low basic cost of £90,000, although it is intended that it should be comprehensively equipped. A three-axis Lear Autopilot is standard, as is emergency oxygen, electrical leading edge de-icing and a jet-blast windscreen rain remover.

It is hoped to roll out the first prototype in December this year and to offer delivery during 1963. The first two aircraft are to be completely assembled in Switzerland.

Swiss American SAAC 23



Straight and Level

THE arrival at Holy Loch of *Proteus*, the Polaris submarine mother ship, resulted in quite a few headlines. The ones I liked best both appeared on March 10, and were:—

Proteus seaman coshed
—Daily Herald

Proteus welcome pleases U.S.
—Daily Mail

● *"The United States Line has cancelled the voyage to Europe of the liner America, scheduled for Saturday, because of lack of bookings. The 450 people who booked passages have been told they can transfer to the liner United States, sailing on Friday, or to a later sailing. The United States, which can carry 1,700 passengers, had bookings for about 900."—Reuter.*

Is this the beginning of the end for Britain's new Queen liner? The Government are to spend £18m on this ship, on the basis of an unpublished report and believing (I quote Lord Mills) that "sea traffic is increasing." Is it? North Atlantic passenger traffic has declined every year since 1957, and last year it was the lowest it has been since 1952. Has there ever been proposed a grosser misuse of public money?

● In this column the other week I expressed my pleasure that the Minister should actually have appointed men with civil aviation experience to two new civil aviation offices. One was Sir Miles Thomas, chairman of the Welsh Advisory Committee for Civil Aviation, and the other was Wg Cdr R. C. Preston, chairman of the similar body for Northern Ireland.

I may have thoughtlessly given the impression that the previous holders of these posts (who under the old system were filled by BEA) were, by implication, men without civil aviation experience. This is not so: Mr S. Kenneth Davies (a private pilot for 30 years and founder of Cambrian Airways) and Sir Walter Edmenson could not be re-appointed because they are both members of BEA's Board. I am so sorry that my enthusiasm for the new appointments should have made me careless of the previous chairmen's feelings.

● An American reader writes: "One of the evening papers last week carried a note to the effect that it was 'rumored' among some engineers that the turbofan idea was embodied in the Rolls-Royce Conway." Possibly the aviation commentator of *Time* has seen the reference, for he writes in the current issue: "Engineers have long known that the turbofan is the most efficient engine for subsonic aircraft. Rolls-Royce pioneered turbofan development, turned out a prototype of its famed Conway by-pass engine in 1950. But US enginemakers, under pressure from the military to produce regular jet engines that are more efficient at supersonic speeds, lagged behind."

Rolls-Royce developed the engine.

Cover the top half of this picture, and then guess from the trousers and footwear the ranks, names and nationalities of the officers on the left and right. Answers: left, Air Marshal Sir Charles Elworthy, C-in-C, RAF Middle East Command (Aden); right, Col Stewart Carter, commander of the Trucial Oman Scouts. Their nationality —it seems rather unnecessary to say—is British

Sir Frank Whittle invented it. Yes, this is Straight and Level's Be British Week.

● Do you remember how TWA were caught a bit short by the jet age because (it is said) no one could find Howard Hughes, the man with the money? So they advertised their Lockheed L.1649A Super Connies as JETSTREAM STARLINERS. "Let's not undersell these fine piston-engined airplanes," I can imagine TWA's advertising boys saying at the time.

Now it seems that American Airlines feel they have been caught short by the *space* age. Their turbofan Boeings are advertised as introducing "STAGE II OF THE JET AGE." Not only that, but the turbofan Boeings are billed as "ASTROJETS."

Passing thinks: Wasn't it the Comet 4 that introduced Stage II of the jet age two and a half years ago?

● Here's another example of the soft jet sell, from a Civil Air Transport (Formosa) advertisement in *Time* magazine:

"Soon—THE MANDARIN JET . . . In Convair's 880 . . . aircraft design has reached the peak of structural integrity and grace. Uninterrupted Airflow . . . Super-Streamlining . . . Unbridled Power . . . and aircraft skin smoother than Chinese Silk . . ."

Confucius he say: Never ride in rickshaw with unbridled coolie.

ROGER BACON

Uncle Roger's Heartache Corner

I AM an airline flight engineer, and yesterday I was rostered for the morning jet service to Potters Bar. When I entered the cockpit I found that all six seats were occupied by pilots, each one armed to the teeth. I protested but was immediately shot in the legs by the captain. What shall I do if this happens again?—DISGUSTED, HEATHROW.

Uncle Roger writes: Don't *let* it happen again—always make sure you get into the cockpit first, preferably armed with a twelve bore.

TEN days ago the wing of one of our new aircraft "failed safe," but we didn't discover this until yesterday when the safe bit went too and the whole wing fell off, severely damaging the hangar floor. This happened during a Check 4 when a canteen tea trolley bumped into the wing by accident. We have complained to the manufacturers, pointing out that aircraft structures should not break as easily as this, but all we can get out of them is a puncture repair outfit. Ought we to report the matter to the SBAC?—WORRIED CHIEF ENGINEER, HAMPTON WICK.

Uncle Roger writes: No, do not report the matter to the SBAC—that would be too extreme an action. You must tell your canteen girls to be more careful.

AS an airline stewardess I would like your advice on a problem that has been worrying me for some time. A captain I know has been doing something which I am sure is wrong but I daren't tell anyone in case I get him into trouble. Please help [full details enclosed].—DORIS PINKFIT, 36-24-36, GATWICK.

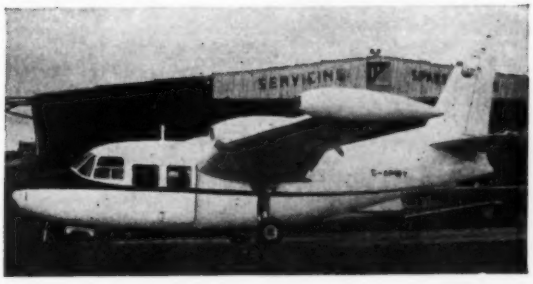
Uncle Roger writes: Yes, this captain is definitely acting improperly. You must stick to your principles and tell him that it is wrong to fly in controlled airspace in IMC conditions without first filing an IFR flight plan.

PIAGGIO of GENOA

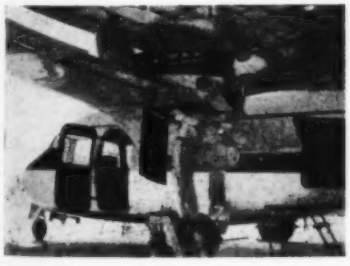
PIAGGIO

P.166
VERSATILE EXECUTIVE

Designed in 1958 as a de luxe executive, the first production Piaggio P.166 came to England in April 1959 to join the business fleet of Sir Robert McAlpine & Sons; it was followed in August by another for the Earl of Derby. Today there are five P.166 Executive Twins in Great Britain, including one operated by The United Steel Companies of Sheffield



British owners of the Piaggio P.166 are assured of After-Sales Service and Spares by McAlpine Aviation at Luton Airport (Luton 8073). This ARB approved organisation holds a £30,000 stock of P.166 spares, the hangar being manned seven days a week, and is authorised to service and overhaul Piaggio aeroplanes. Maintenance work is based on the experience gained with a fleet of three P.166



Features of the Piaggio P.166 are easy entry from the ground, a spacious cabin, panoramic outlook for all, simple servicing and accessibility—all due to the high-wing pusher layout

See the Piaggio P.166 at the Shackleton Sales Week End Baginton 28, 29, 30 April

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BY BRUCE ROBERTSON

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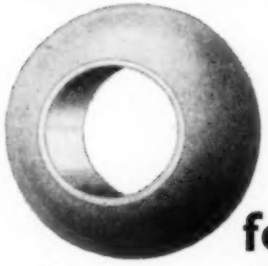

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Correspondence

The Editor of "Flight" is not necessarily in agreement with the views expressed by correspondents in these columns. Names and addresses of writers, not for publication in detail, must in all cases accompany letters.

Commonwealth V-bomber Squadron?

AUSTRALIAN press reports have it that Mr Amery has told the House of Commons that the RAF is worried about the lack of aircrew for the V-bombers.

Well, hasn't anybody thought of forming a composite Commonwealth V-bomber squadron? I am sure the Royal Australian Air Force would only be too happy, particularly if the unit were based in the Far East. If it were not, what matter? The idea is there. A Commonwealth transport squadron has existed for years. Why not a V-bomber squadron? The RAAF would be foolish to lose the opportunity. So would the Indian Air Force, the RNZAF, and other forces with Canberras that must eventually be replaced.

Balwyn, Victoria, Australia — STANLEY BROGDEN

"Malaya to Middle Wallop"

I WAS surprised to read the niggling criticisms by Mr Haimes (in your issue of March 3) of the good show put up by Capt and Mrs Somerton-Rayner. The difficulties met with on this flight can hardly be less than those encountered on the equally gallant pioneer efforts of Hinkler, Chichester, Amy Johnson and company, largely because so many countries would rather hinder than help the private flyer. Among these our own country must be included, despite the "energetic manner" in which the MoA is attacking the "immensely difficult problem" of letting the PPO off the hook.

I was very tempted to join this happy band until the latest clampdown on March 1 was announced, as a result of which I must assume that a Taylorcraft and I would be as welcome over Surrey as a U-2 is over Sverdlovsk. The value of having radio fitted can be seen from Capt Somerton-Rayner's and Ron Flockhart's experiences. It enables the local ATC to enquire whether you have enough fuel to go on somewhere else. If so, you can be ordered to land; if not, you are told to go away.

Farnham, Surrey — R. E. RENSHAW

Why Explore Space?

DIANA SINGLETON has "asked a good question" in your correspondence, March 3. I am strongly in favour of space exploration and hate to hear the lame excuse "Because it is there." This is out of all proportion to the expense and labour involved.

The plain fact is that Man is basically a wild animal and needs living space. At long last, instead of preying on one another, we have the prospect of getting our needs on other planets. But unless we are prepared to carry out vast engineering works on selected planets, to make them habitable, astronautics should indeed be limited to a mere branch of research.

I hold that we *must* be prepared for this vast engineering, and moreover, we can develop many techniques in the deserts of this planet, particularly Antarctica. If some take the tame course and restrict populations, others will not. Man's problem has only the one solution I have stated above.

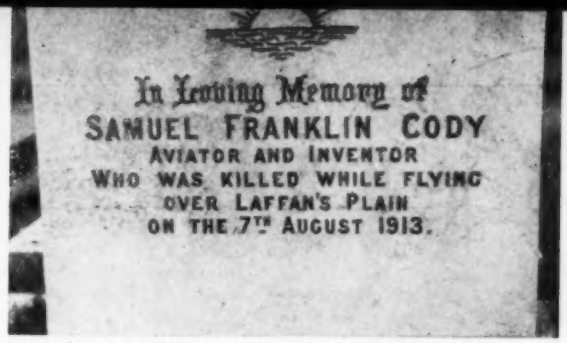
Kingston-upon-Thames, Surrey — R. C. ABEL

JUST a word in answer to Diana Singleton's query (*Flight*, March 3) which raises many problems, although rather out of *Flight's* field. It may seem callous—and even downright wicked—to help others only, almost, "in passing," while forging ahead oneself: but would not the devotion of *all* available resources to the elimination of poverty merely result in stagnation?

Taking the broad view; will not current expenditure on nuclear and thermonuclear weapons lead us to the source of power for the human race in a few centuries' time, when "natural" fuels are expended? The aeroplane, developed largely in war, is bringing immense benefits to the undeveloped countries. After all, as Benjamin Franklin asked, of what use is a new-born babe?

Why explore space? I don't know: perhaps it will turn out to be the ultimate in all limbos: but perhaps it will not—the question really is, can we afford not to find out?

Llangefni, Anglesey — FREDERIC K. JONES



Cody's grave (see letter from Mr J. Denton Robinson)

Cody and "Colonel"

THE letter from Mr Basil Clarke under the above heading [page 320, March 10] is most interesting and prompts me to send these photographs [one of which is reproduced above—Ed] of his grave at Aldershot—close to where he was killed. The inscription states that he was an "aviator and inventor."

Darlington, Co Durham — J. DENTON ROBINSON

Do-it-yourself Escape

WITH reference to Mr R. A. Miles' letter in the December 16, 1960, issue of *Flight*, I have dug up the following information. The television story to which he refers was originally written by Oreste Pinto and was included in his book *Friend or Foe?* (G. P. Putnam, 1953). It would seem, however, that the script writer took some liberties with Col Pinto's story. Your correspondent's letter makes reference to the fact that the nobleman's manservant later proved to be a Nazi agent. There is no mention of this in the book. Nor is there any mention of a Spitfire escort for the ramshackle airplane. In fact, the book points out that they crash-landed in a field.

As to the construction of the aircraft, I can be of little help. Col Pinto states that the wings were wooden planks, that piano wire was used for the struts and that the wheels came from the aristocrat's Rolls-Royce, as did the engine.

Although I cannot be certain, it is reasonable to assume that the story is pure fiction and has no basis in fact.

Brooklyn, NY — EDWARD M. FENNELL

[A reasonable assumption.—Ed.]

Theory of Relativity

STRAWS, they say, show the direction of the wind, be it a wind of change or any other. Miss Patricia Hammond (aged 15) shows that the coming generation is building up a resistance to noise which may, or may not, get less with advancing years. But what I really am writing about is the fact that Newbury, where I was born and which was my home until I was married, was not near Greenham Common. Greenham Common was (and is) near Newbury, which is quite different. So much for the influence of a USAF station.

London W1 — FRANK SMITH

[Agreed; but we quoted our correspondent's home town in this manner in order to indicate that she lives near a jet-noise source.—Ed.]

FORTHCOMING EVENTS

Mar	23	RAeS: Fourteenth Louis Blériot Memorial Lecture, "Problems of Short Take-off and Landing," by H. Ziegler.
Mar	24	Society of Environmental Engineers: Annual General Meeting.
Mar	25-26	McAully Flying Group and The Tiger Club: Rally, Little Snoring.
Mar	29	RAeS Agricultural Aviation Group: "Atomization," by R. P. Fraser.
Apr	5	Kronfeld Club: "Air Touring, Including the Sahara Rally," by John Dykes.
Apr	10	RAeS Historical Group: Discussion Evening.
Apr	10-11	Loughborough College of Technology: Symposium on "Applications of Analogue Computers."
Apr	11	RAeS: "Direct Electrical Power Generation by Thermal and Chemical Means," by Prof M. W. Thring.
Apr	11	Guild of Air Pilots and Air Navigators: Annual Banquet.
Apr	12	RAeS Graduates' and Students' Section: "Man-powered Flight—Progress to Date," by H. B. Irving.
Apr	12	Kronfeld Club: "Pilcher, the Pioneer of British Aviation," by Lord Braye.
Apr	12	Society of Environmental Engineers: Discussion on "Climatic and High-vacuum Environmental Test Chambers."
Apr	19	RAeS Agricultural Aviation Group: "A Review of Current Developments in Agricultural Aviation," by Dr W. E. Ripper.
Apr	20	RAeS Astronautics and Guided Flight Section: Symposium on Air Traffic Control.
Apr	25	RAeS: "On the Origin, Structure and Growth of Vortex Separations," by E. C. Maskell.
Apr	26	Royal Air Force Anniversary Concert, Royal Festival Hall, London.

RAeS Branch Fixtures (to Mar 30): Mar 28, *Luton*, a.g.m. and Presidential Address; Mar 29, *Brough*, "The New 'Bluebird'," by K. W. and L. F. Norris; *Christchurch*, lecture by G. Wakefield; *Reading*, a.g.m. and Film Show; *Southampton*, a.g.m.

THE INDUSTRY

Transportable Instruction

THE necessity of providing specialized training on new aircraft and engines for aircrews, groundcrews and maintenance men increasingly presents major problems for civil and military operators. Most airframe and engine manufacturers have for some years co-operated with airlines and air forces in this task, both by sending out service engineers to the operators' bases to give help and instruction on the spot and also by providing courses, designed to meet the customer's requirements, at special training centres: an example is Bristol Siddeley's Engine School, where training is provided on all the company's current engines, from pistons and turboprops to the latest turbojets and ramjets.

Many operators, however—and particularly those overseas—can allow only a limited number of their personnel to visit the schools. The selected few are then responsible on their return for the training of their fellow-workers. Here they meet with a formidable obstacle—the lack of equipment and facilities for instruction and demonstration purposes.

To overcome this difficulty Bristol Siddeley have designed a "transportable training unit." The first such unit to be completed is for the Orpheus, but it can be readily adapted for other Bristol Siddeley engines. The unit is equipped with an Orpheus with its components divided into five main sections in an "exploded" manner for easy examination. Each section is mounted on a separate tubular stand. These stands are fitted, where appropriate, with trays for the display of specimen components such as blades, igniters and fuel spray jets. All five stands are on castors for easy handling.

Four illuminated instructional aids on stands demonstrate fuel, air, oil and starting systems. In addition, a complete training kit for instructor and students is provided. This comprises a projector and a portable projection screen, films, and slides, lecture notes, manuals, brochures, drawings and charts.

The whole of this equipment can be quickly packed into two specially designed wooden cases, both measuring 4ft 10in wide and 5ft 9in high, but one slightly longer than the other—11ft 2in as compared with 10ft. Weights of the cases, fully loaded, are 2,100lb (955 kg) and 2,000lb (910 kg) respectively. These cases can be easily transported by road, rail or air. Training units for larger engines, such as the Olympus, would require three packing cases. The cases are strongly built on a double boarded base secured to three metal-clad skids, and are fitted with a lockable door at one end. Along the floors are rails which guide the stand wheels during loading and unloading, and to which the stands are bolted to provide a positive location. Ramps for loading and unloading are provided with each case. The cases are constructed by Tom M. Scotney Ltd, of St Ives, Hunts.

Part of the Bristol Siddeley transportable instructional unit described above—an Orpheus engine divided into its principal component sections

On the main bulkheads of the de Havilland Comet 4Cs supplied to Middle East Airlines is this attractive mural design in Warerite laminated plastic (by Bakelite Ltd). "Tessuto" pattern Warerite in biscuit and blue is also widely used in these aircraft for other bulkheads, side walls and galley panelling and doors

New Marconi Microvoltmeter

HIGH gain and freedom from hum characterize a new a.c. microvoltmeter, Type TF 1375, introduced by Marconi Instruments Ltd. Covering the range 5μV to 15V in 12 steps, it is fully transistorized and completely portable, with self-contained battery supply. The frequency range is 50 c/s to 1 Mc/s with switch-selected 1.f. rejection.

The TF 1375 can be used for a variety of purposes; for example, as an oscilloscope pre-amplifier, as a sensitive measuring-bridge detector, or for field strength and aerial tests. In conjunction with a suitable pick-up loop, measurement may be readily made of leakage flux emanating from mains transformers and electric motors. Input impedance and sensitivity are such that it can be used as a microammeter for detecting currents as low as 10^{-16} ampere.

IN BRIEF

From Cableform Ltd of Romiley, Cheshire, comes a leaflet describing and illustrating their new fully transistorized photo-electric detector Type CF69A.

Pritchett & Gold and E.P.S. Co Ltd, makers of Dagenite batteries, have transferred their Newcastle depot to 20 Bankwell Lane, off High Level Bridge Approach, Gateshead-on-Tyne 8 (Gateshead 70034).

The extremely wide range of steel supplied by Hadfields Ltd of East Hecla Works, Sheffield 9, are specified in detail, with composition, properties and related specifications, in a new brochure (No 463) entitled *Fine Steels*.

Mr J. D. Sinclair has been appointed to the board of Amplivox Ltd and is now director of the industrial division, which is expanding the development and production of microphones, headsets and sub-miniature amplifiers.

B & K Laboratories Ltd, of Tilney Street, London, W1, announce a number of appointments, among which are those of Mr Ronald E. Walford (previously with G.E.C.) as installation engineer for their Vibration Systems Division and Mr Hugh Murphy as shipping manager.

Recent appointments within the Solartron Electronic Group include those of Mr Don Richards as chief development engineer of Solartron Laboratory Instruments Ltd and Mr Roy W. Elvidge as sales manager of the same company. Mr D. R. Hall, regional manager, will now be responsible for the London Region (formerly the Eastern and Southern Regions).

From January 1 next year four assistant managing directors are being appointed by Castrol Ltd to handle the growing expansion of the group's interests and further developments which are envisaged. Those designated are Messrs J. A. V. Watson, OBE, L. G. Packham, C. E. R. Millidge and A. A. Barr, all of whom are directors of the parent company. These changes will follow the retirement, at the end of this year, of Mr. W. F. List, who has been assistant managing director since 1951. He will remain on the board.

AIR COMMERCE

Seen at Gatwick just before departing for Freetown is one of two Twin Pioneers leased from Scottish Aviation by British United Airways, who are now responsible for Sierre Leone Airways. See note on this page

NEW ORDERS FOR AVRO—

SALES of Avro 748s have increased to 24 following an order for nine Series Is (Rolls-Royce Dart RDa.6 Mk514) from Aerolineas Argentinas. The contract, which was announced in London on March 16, includes an option on a further five aircraft; with spares it is valued at £2.5m. The first aircraft is due to be delivered in October, and the remainder will follow within six months.

Perhaps the most interesting aspect of this order is that, about a year ago, Aerolineas had placed tentative orders with Fairchild for ten F-27s, and were trying hard, in a tight-money situation, to obtain Government approval for the necessary expenditure. In the event this order did not materialize, nor were Canadair more successful in attempting to sell to Aerolineas Eland-powered Canadair 540s, although a demonstrator was sent down to Buenos Aires.

The 748s are intended to revitalize Argentina's domestic services, supplementing and later replacing the airline's Convair 240s and 15 DC-3s. Aerolineas, who are Comet operators, will thus have a second Rolls-Royce-powered type in their fleet.

It is reported as this issue goes to press that Aerolineas Argentinas is considering also the purchase of six ex-Capital Vickers Viscounts; if this is confirmed the airline will become entirely British-equipped.

—AND FOR DE HAVILLAND

A THIRD Comet 4 has been ordered by East African Airways for delivery in about a year's time, in April 1962. The Comet order book now stands at 63, of which airline orders account for 58. East African's previous two Comets were delivered last summer, and have since mid-September been used on services from Nairobi to the United Kingdom, South Africa, and Pakistan and India. East African say that the Comet's effect on passengers and revenue "has been considerable." To recap, Comet orders now stand as follows: BOAC, 19 Comet 4s (all delivered); Aerolineas Argentinas, 6 Comet 4s (all delivered); East African Airways, 3 Comet 4s; BEA, 14 Comet 4Bs (7 delivered); Olympic Airways, 4 Comet 4Bs (3 delivered); Mexicana, 3 Comet 4Cs (all delivered); UAA, 5 Comet 4Cs (3 delivered); and MEA, 4 Comet 4Cs (3 delivered).

—AND FOR BOEING

SIX Boeing 720Bs have been ordered for delivery at the beginning of June by Northwest Orient Airlines. According to Mr Donald Nyrop, Northwest's president, the value of this order is $36,772,000 (about £13m). The aircraft could be used between the US West Coast and Hawaii and on Northwest's non-stop services across the USA, at present operated by the airline's five DC-8s. It is intended, however, that the 720Bs (Pratt and Whitney JT3D-1) should become "the backbone of the Northwest domestic flight system."

Ghana's order for two Boeing 707-420 (Rolls-Royce Conways) was signed on March 16 at Accra. The aircraft, which will supplement three VC10s already ordered, are due for delivery in 1962. The number of Boeing 707s and 720s sold is now 274, of which 186 have been delivered.

SIERRA LEONE AND BUA

RENAISSANCE of Sierra Leone Airways will be the result of an agreement signed in Freetown by British United Airways and the Minister of Communications, Mr Doyle Sumna. The present agreement between the Sierra Leone Government and Nigeria Airways for the operation of internal air services will accordingly be terminated. British United Airways will be responsible for re-starting internal services from Freetown to up-country mining centres—services which, operated by Nigeria Airways D.H. Rapides, ceased earlier this year. On Saturday of last week, March 18, a Twin Pioneer—one of two leased by BUA from Scottish Aviation—left Gatwick for Freetown where it will introduce services soon after arrival. The second will follow later.

In a month's time, on April 27, the British Colony is to obtain its independence and British United are thus in on the birth of a new African airline which may in due course become an international carrier. More important than this, it may be supposed, is the opening which this may provide British United for services under the Sierra Leone flag. Britain's biggest independent is not a newcomer to the country, having operated its West African *Safari* service to Freetown and Accra *via* Lisbon, Las Palmas and Bathurst since June 1954.

BREVITIES

The appointment of Mr Anthony H. Milward to the board of BEA has been renewed by the Minister of Aviation for another five years—until April 30, 1966.

TCA lost £869,100 in 1960, the airline's first deficit for ten years. The loss is attributed to a reduction in revenue rate and to the cost of introducing DC-8s and Vanguards.

A Bonn source reports that East Germany's attempts to create an aircraft industry have now been abandoned. This presumably implies abandonment of the Baade 152 jet airliner.

According to the *Daily Mail*, the Minister of Aviation has decided that Cannon Street Station is to be developed as London's major heliport. The other two possible sites recommended by the Ministry committee set up in July 1959 were the Nine Elms Goods Depot and St Katharine Docks.

A US Federal court has ruled that Pan American has violated US anti-trust laws by restraining air traffic to South America through its financial interest in Panagra. The case first came up in 1953. It is now likely that Pan American will have to give up its 50 per cent shareholding in Panagra.

The new Venezuelan international airline Viasa has ordered a second Convair 880-M. The first will be delivered in May and the second in September, and they will be used for services from Caracas to New York, Miami/New Orleans, and Bogota/Lima. FAA certification of 880-M is expected in July; orders for all versions of the Convair jet airliner family now number 97.

Swissair made a net profit in 1960 of nearly £410,000 on a revenue of £27½m. A dividend of 4 per cent has been recommended.

Flight-testing of the prototype Potez 840 16/24-seater feederliner (four Turboméca Astazou turboprops) is due "very soon," according to the manufacturers.

Marconi announce that BOAC, after what is described as "an intensive valuation," have decided to equip the corporation's fleet of 19 Comet 4s with Marconi Doppler Navigators type AD2300A.

BOAC are reported to be considering the possibility of self-insurance, following a difference of opinion with Lloyds underwriters with regard to premium rates. Hitherto, unlike BEA, BOAC have not held reserves for self-insurance.

Regulations governing the Air Operator's Certificate came into operation on March 20. They provide for appeals against decisions of the Director of Aviation Safety and prescribe the length of notice to be given to a certificate holder by the Director before he suspends, revokes or varies a certificate. There is also a fixed period in which the Director must give the reasons for his decisions.

Sud Aviation announce delivery dates for United Air Lines Caravelle VIRs as follows: four between April 30 and June 30; two at the end of July; one at the end of August; two at the end of September; three at the end of October; three at the end of November; four at the end of December; and the twentieth and last aircraft in January 1962. The US airline plans to inaugurate Caravelle services during July.

AIR COMMERCE . . .

Boarding a BOAC Boeing 707 at London Airport on March 14 with Sir Matthew Slattery, chairman of BOAC, is the Duke of Edinburgh, Grand Master of the Guild of Air Pilots and Air Navigators. Among the passengers were 70 members of the Court and Livery of the Guild, including AVM Donald Bennett, Capt O. P. Jones and Air Cdre Sir Frank Whittle. During part of the flight the Duke flew the aircraft from the right-hand seat

BEA's PILOTS WILL NOT STRIKE

WHAT has been described as a "triumph of moderation both by BEA and by BALPA" has led to an amicable settlement of the dispute over the future of Capt James Thain. It will be recalled that BEA's pilots felt so strongly about the injustice, in their view, of Capt Thain's dismissal—the result of disciplinary action following the controversial Elizabethan accident at Munich in February 1958—that a ballot was taken on a proposed strike. The results of this ballot have not been published, but it is understood that there was a majority in favour of a 24hr strike. BEA have now agreed to pay for the training necessary to renew the licence of Capt Thain, who has been suspended since the accident.

Capt Thain and BALPA have always maintained that the Munich disaster was caused primarily by slush, the dangerous effects of which have since been recognized by the Ministry, and not by icing of the wing. Capt Thain is reported to have said last week: "I am warmed by the generous support shown to me by the pilots. I do not yet know the full details of BEA's offer but their invitation looks hopeful." He said that the cost of his licence might be as much as £2,000.

LONDON'S EXTENDED RUNWAY

TOWARDS the end of this month runway 10R/28L at London Airport should be open again. It has been extended westwards to provide a total paved length of 11,000ft, and a 200ft connecting stub on the end allows for further expansion.

Beyond the end of the runway's western extremity, work is in progress on culverting the Duke of Northumberland's and Longford rivers, 300ft to the west. Take-off from 28L will be through an obstruction-free gap, 650ft wide, between cranes up to 60ft high on either side. Their presence will mean that the threshold of 10R will be temporarily displaced.

Culverting the rivers is a major civil engineering job, but it is necessary to reduce the hazard of an aircraft overrunning the extended runway towards the west.

A recent Notam issued by the Ministry of Aviation draws attention to the fact that the runway has primarily been extended for the use of the big jets, and that indiscriminate use of it "may adversely affect the movement rate due to the lack of flexibility to [*sic*] ATC."

While the runway has been closed, additional lighting has been installed. This will become available when the full runway length of 11,000ft is in use in both directions. When the runway is re-opened, a 3° ILS glide path will be available on 10R, and a localizer on 28L. A STAN 8 glide path is being installed on 28L and a STAN 7 localizer on 10R; these will be available later.

During repair work this winter, some 1,700 concrete pit covers several inches thick have had to be replaced by new special ones bound with iron. Very severe runway wear has followed the first full year of big jet operation and it was found last year that these pit covers, which give access to lighting and other installations, were cracking under landing impact.

STEERAGE CLASS BY SEABOARD

IN the early steamship days passengers who paid the lowest fares travelled in the stern—"steerage." The motion of the ship and vibration of the screw gave them a comparatively rough ride. Not so rough, perhaps, will be the ride suggested by the idea of Seaboard & Western Airlines (Seaboard World Airlines as they are soon to be known) to carry passengers on CL-44D cargo flights across the North Atlantic at single fares of £47 10s.

This IATA carrier has asked the CAB for permission to introduce such fares, though of course even assuming that this is granted IATA will fail to agree. The matter is believed to have been raised, though not formally discussed, at the recent IATA traffic conference in Cannes. There is certain to be unanimous opposition by the North Atlantic passenger carriers.

The £47 10s fare compares with the lowest London - New York 17-day winter excursion propeller fare (expiring on March 31) of £114 6s return, a theoretical £57 3s single. No meals will be served on the proposed low-fare services and there will be accommodation for 15 or more passengers, who are looked upon, says Seaboard's president, Mr Richard Jackson, "as a self-motorized low-density cargo. An average passenger weighs 160lb. With 66lb of luggage that makes him the equivalent of 226lb of freight."

Hitherto the North Atlantic freight business has been largely built up by passenger airlines carrying freight as fill-up. Now an all-cargo airline wants to carry passengers as fill-up.

Both turbofan members of the Boeing jet family have now been certificated by the FAA and 720Bs are now entering scheduled service with American Airlines (by whom they are designated "Astrojets"). This striking shot shows well the P&W JT3D-1s of the Boeing 720B, of which American Airlines are eventually to have 25

BOAC TO LOS ANGELES

EXPANDING westwards to Los Angeles, BOAC opened its Boeing 707-420 services from London this month. The route is described as direct, involving 5,443 miles *via* a stop at Montreal westbound only.

The Los Angeles area can stand the intense competition being provided by international airlines. It is growing at a fantastic rate, with a population of 6¾m spread over the 455 square miles of the city plus its suburbs (which are independent cities such as Beverley Hills). More important than sheer size and growth—this being at the rate of 700 a day from outside plus natural increase—is the fact that the residents have a greater prosperity than any other city in the world. BOAC's service has started as twice weekly.

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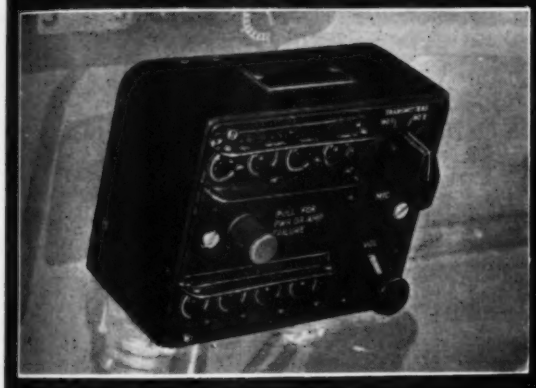

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AIR COMMERCE . . .

TEAL's Electras will become wholly owned by New Zealand if Qantas agrees to sell out its half-share in the airline. TEAL might then re-equip to undertake new long-haul services; they are said to be interested in the VC10. A partnership arrangement has been tentatively suggested by BOAC

but will be increased to three times weekly by May. The target is a daily service by April 1962.

With the sudden and long-delayed interest being taken by the USA in attracting foreign tourists, Los Angeles proved to BOAC that it genuinely wanted its share of European tourist traffic, and gave promise of help in building up two-way traffic for a new route missing the eastern seaboard. Montreal is only a technical stop, BOAC having no traffic rights there on this service.

STATE-CONTROLLED INDEPENDENCE

FOLLOWING a route survey in New South Wales the NSW State Government may transfer to East-West Airlines of Tamworth a number of services now operated by Ansett-ANA. Some observers in Australia believe that Ansett-ANA is attempting to monopolize air services in New South Wales by taking over East-West Airlines through its subsidiary, Airlines of New South Wales. According to Mr Heffron, Premier of New South Wales, the route survey is part of the State Government's plan to protect East-West's independence.

Airlines of New South Wales and East-West are the only fully intra-state airlines, and the Government has the power to allocate their routes. The NSW Cabinet has directed that at least two intra-state commercial airlines should continue to operate independently, with a fair share of air miles for each and a reasonable service to the public.

This is the second time within a year that the State Government has come to the aid of East-West against reported take-over bids. Last May Ansett-ANA offered a total of £A410,000 for EWA shares. East-West is a small company, employing only 157 people, but it operates scheduled services over 5,667 unduplicated route miles with a 40-seat F-27 Friendship and four 32-passenger DC-3s. One of EWA's Twin Bonanzas, used with two Lockheed Hudsons for charter work, is being used for rain-making experiments under contract to the Commonwealth Scientific and Industrial Research Organization (see "The Rainmakers" *Flight*, March 16).

BELFAST'S NEW AIRPORT

ACCORDING to the Ministry of Aviation some 900,000 passengers are expected to pass through Belfast's new civil airport at Aldergrove by 1968. The present airport at Nutts Corner is unsuitable for modern aircraft and the mountains which surround the approaches make it virtually impossible ever to make it a satisfactory airport.

A rail link between Belfast and Aldergrove has been rejected as being uneconomic, but the Ministry are to press ahead with the design of a new air terminal to be built on Aldergrove's north-eastern corner. It will consist of a main block in which passenger and baggage-handling facilities are on ground level and a restaurant and departure hall are on the first floor. Departing passengers will enter a pier leading to aircraft embarkation gates serving six aircraft stands. In addition to the main block there will be an eastern administration wing containing the operational offices and an additional gate capable of serving a further two aircraft stands. The apron will provide parking space for ten aircraft of Vanguard size or larger.

Contracts for the building will be placed by the Air Ministry works department in time for an autumn start. Work should be completed by the spring of 1963. BEA have been closely concerned with the planning of the new terminal and are to erect their own buildings at Aldergrove, mainly for handling freight.

LOW FARES FROM AFRICA

SOUTH African travel agents and Mr Max Wilson, chairman of the Overseas Visitors' Club, for whom non-scheduled flights from Lourenço Marques are operated by Overseas Aviation, appear to have come to terms over low fares between South Africa and Europe. Since early last year a war of increasing intensity has raged between the Club and the Association of South African Travel Agents, but this now appears to have been settled. In a joint statement issued last month Mr Wilson and the ASATA said that "it was felt that a formula might now be found to achieve peace in the travel industry."

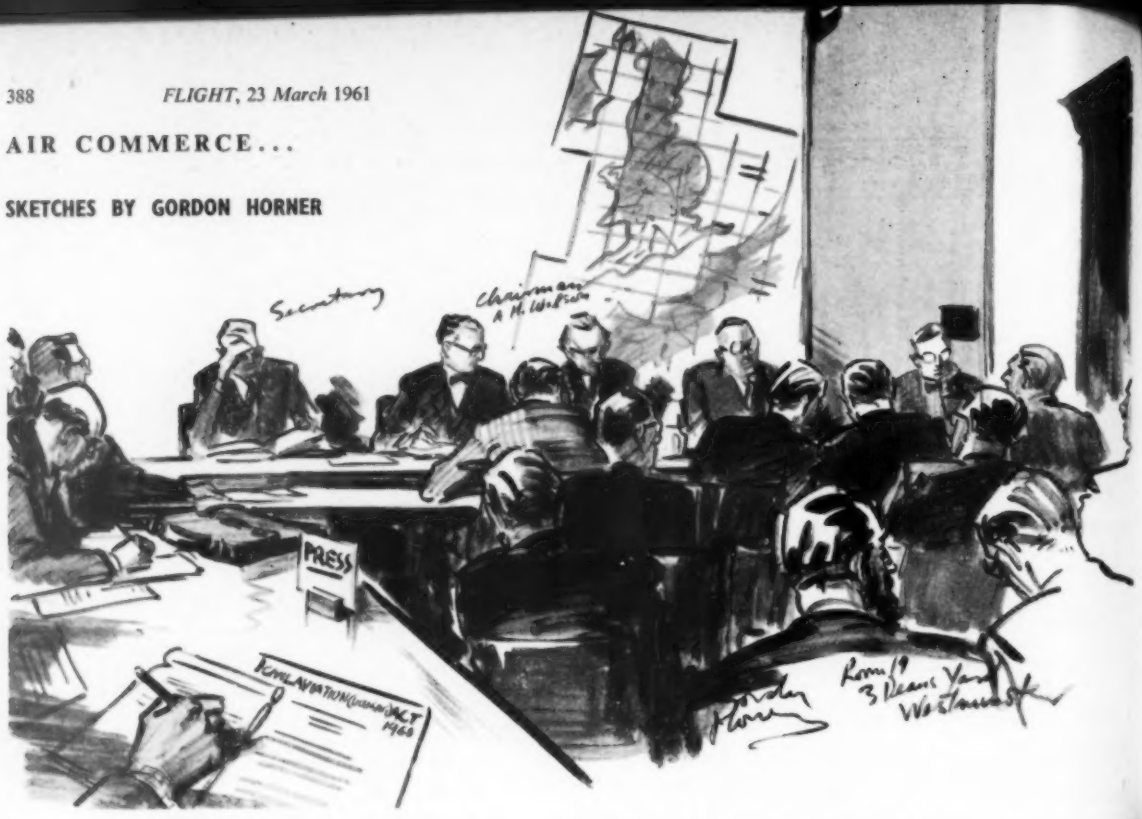
The dispute arose from attempts to operate the Club's closed-group charters from Johannesburg, at first against the opposition of South African Airways and subsequently with their agreement; a year ago SAA was reported to have signed with the Club a £250,000 contract for about 30 group charters a year. South African travel agents said that low fares were to be welcomed but they must be available to all passengers and not just club members.

Since then, South Africa's experience of Skycoach services has been that low fares create new markets; the general manager of South African Airways, in his annual report to Parliament, noted that in spite of the introduction of economy class fares on intra-African services patronage of standard Viscount services had risen by about 12 per cent. "Entirely new markets were opened up by the Skycoach services without any material effect on the normal services." This report may bring South Africans to the conclusion that another "entirely new market" would be opened up by sharp cuts in fares to Europe now proposed by the Travel Agents Association and by Mr Max Wilson.

At the invitation of SAFEGE, the French company who are developing a monorail system, 20 Members of Parliament recently visited a demonstration site near Paris. They travelled from London in a BEA Vanguard

AIR COMMERCE...

SKETCHES BY GORDON HORNER



THE BOARD'S FIRST HEARING

Air Transport Licensing Board Opens Shop

BY THE AIR TRANSPORT EDITOR

RATHER than offering a detailed report of the new Air Transport Licensing Board's first hearing on March 14, which dealt with applications of relatively limited interest, we thought it appropriate to record our general impressions of the occasion, and of the hitherto little known (at any rate in the air transport industry) men who will influence the destiny of Britain's air transport industry.

IN a way it was the Air Transport Licensing Board, and not the applicants for licences, who were on trial at 3 Dean's Yard, Westminster, on Tuesday of last week. Not many of the sixty-odd people who turned up for this first hearing of the new Board can have been quite sure, as the court room clock ticked towards 2.30 p.m., what sort of men were going to take their places at the long table.

What would they be like, these seven Solomons who (the corporations tremulously fear) are going to take away much of their business and hand it over (the independents hope) to private enterprise? Some not-too-respectful words had been written and spoken about their superannuation and their lack, with the main exception of one member, of aviation experience. Would they know the difference between a Viking and a Viscount? Would their questions be pointed or, because of their inexperience of the industry, pointless?

Nobody in the tightly packed audience of first-nighters quite knew what to expect as the door opened at 2.25 p.m. and these men of destiny, preceded by their secretary and assistant secretary, walked on to the four boards and a passion of British air transport. After a decorous interval of a few moments Mr A. H. Wilson, the acting chairman (the exception just referred to) entered, diffidently nodded a "good afternoon" to the audience, and took his place.

Impartiality essential—Mr James

He wanted first of all, he said, to apologise for the rather cramped conditions—but things would be better when the Board moved to their new offices in the City. The procedure would be much the same as that of the old Air Transport Advisory Council; the main difference was that the hearings were in public—though this in itself would not make any difference to procedure. But, we

SEVEN SOLOMONS

Mr A. H. Wilson, CB, CBE (acting chairman). Age 65. Recently adviser on air transport, Ministry of Aviation, and since assessor with the Air Transport Advisory Council. Joined Civil Service in 1930, Board of Trade, later GPO and Air Ministry. In 1943 Assistant Secretary in the Civil Aviation department which in 1945 became Ministry of Civil Aviation. Under Secretary 1946, Deputy Secretary 1956.

Professor R. G. D. Allen, CBE. Age 54. Professor of Statistics at the University of London since 1944. From 1928 lecturer in statistics at London School of Economics; 1939-41 statistician in Treasury. Director of records and statistics, British Supply Council, Washington. From 1947 statistical officer, Treasury, later consultant, UN Statistical Office.

Mr C. Bagnall, CBE. Age 51. Managing director British Nylon Spinners since 1945; 1940-42 technical adviser on organization, War Office; 1946-49 chairman, Wales Business Training Committee; 1949-52 member of council of British Institute of Management; chairman of South West Regional Council of the FBI 1956-57; governor of Ashridge College 1958.

Mr E. Baldry, OBE. Age 65. Fellow of the Institute of Chartered Accountants and senior partner in Allen, Baldry, Holman and Best. Member of Society of Incorporated Accountants since 1919, in public practice for past 33 years, elected a member of the Society's council in 1949. Elected vice-president 1956 and elected to the council of the Institute of Chartered Accountants 1957.

Mr C. P. Harvey, QC. Age 60. Called to the Bar 1923. Civil Defence 1939-40. War Office 1940-43. British Council 1943-45. Legal Assessor to General Medical Council and to UK Dental Board 1947. Deputy chairman, Beds. County Quarter Sessions since 1950.

Sir Friston How, CB. Age 62. Civil Service in 1920 after serving in the 1914-18 war. First appointed to the Exchequer and Auditing Department and later an inspector of taxes. From 1937 in the Civil Aviation Branch of the Air Ministry. During the Second World War Ministry of Aircraft Production. After the war Ministry of Supply Under Secretary. From 1954 until 1959 secretary of the Atomic Energy Office.

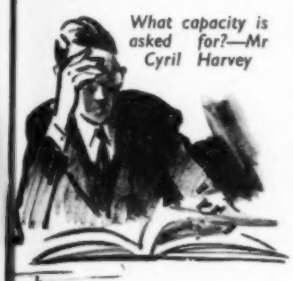
Mr W. P. James, OBE. Age 67. Civil Service in 1919 after serving in the 1914-18 war. Ministry of Pensions. From 1934 Ministry of Transport in the Road Transport and Shipping divisions, and since 1952 chairman, West Midland Traffic Area.

wondered, would it—and will it in the future—make any difference to the arguments that are put forward, the manner in which they are put, and the decisions that are made? This was the first time that there had been a public hearing into the licensing affairs of British air transport. A table had been set aside for the Press; but it was curious that none of the daily newspaper air correspondents was in attendance at the long-awaited birth of greater public accountability in this public service industry. Was this because the business of the first hearing was uncontroversial and unlikely to produce a good story?

The programme included six applications from two small independents, Air Safaris and East Anglian, for the transfer of licences for inclusive tours—services already approved by the Minister for other operators who, for one reason or another, are unable to take them up. A number of independents had objected to these transfers, so this re-hearing was necessary. As the chairman pointed out, the need for the services had already been approved.

The secretary, Mr J. E. Barnes (seated on the chairman's right) read out the applications. The general procedure was then as follows. The chairman would invite the applicant's representative to state his case, and then the applicant's travel agent would add his support. The objector, and in some cases objectors, would then be invited to state their cases.

Surprisingly, no one stood up to speak (it had also seemed rather odd that no one rose when the Board made their entrance). The applicants and objectors sat along one side of a long, court-room-width table facing the Board, and each had in front of him—rather scruffily inscribed on a piece of cardboard—the name of his firm. There was no smoking, as commanded by another rather scruffy notice pinned to the big wall-sized world atlas behind the Board.



What capacity is asked for?—Mr Cyril Harvey

From time to time, and more frequently as the proceedings warmed up, the members of the Board would ask questions. For example, when one objector alleged that his traffic would be diverted, Sir Friston How asked: "Yes, but would you like to go into that a little further?" What did the objector mean, he asked, by wasteful competition—"have you excess capacity? How can you tell that there is insufficient traffic?"

The chairman, Mr A. H. Wilson, as a chairman should, would sum up an argument with a quietly rhetorical: "As I understand it, you have a licence for a closed-group operation which you were doing without a licence last year, and now you want a licence for . . . ?" Occasionally, Mr Wilson would interrupt an argument that seemed to be getting a bit confused. For example: "What is it that you want precisely, in terms of capacity?" Or, to a travel agent, "we cannot deal with an application from you. All we can deal with is an application from an operator."

Mr Cyril Harvey addressed one objector, who was being accused of what amounted to irregular practices by a travel agent: "All I have heard from Mr — so far is that he does not like the present state of affairs and that he is proceeding to operate without a licence"—did he or did he not agree with [the travel agent] that his services had been advertised in the general Press?

Mr E. Baldry asked an applicant: "In your application you state that some changes are going to be made in your company?" Assured that these were in hand, he said: "As long as you have money in the bank?" Yes, the applicant said.

Undoubtedly the most effective spokesman among the operators was Mr Ashton-Hill of Cunard Eagle. A veteran ATAC campaigner, he deployed his arguments with skill and force, addressing all his remarks, regardless of whether he was answering a question put by a member of the Board, to the chairman. His words were clear, his arguments unmuddled, and he supported his arguments with facts and figures.

One got the impression that good presentation and, above all, a clear voice matter considerably. There was no doubt that the attention of some members of the Board was not wholly arrested by the rather jumbled murmurings of one or two witnesses, one of whom was asked by the chairman to speak up. Certainly their attention was arrested by the applicant whose approach was: "We feel it is entirely wrong to be put at a disadvantage by a new operator . . . we think it patently unfair . . . we consider it to be most unfair . . . we feel very strongly about it . . ." and so on. But here was an airline falling into the trap of over-emphasis, and not supporting its case with facts and figures. There was not much doubt that the Board was unimpressed, if not actually unsympathetic.

One of the ladies who recorded the proceedings

There were no explosive moments, as there will be when the big guns of the corporations open up (contingents from both BOAC and BEA—a particularly strong one from BEA—could be observed among the audience). But there were some mild fireworks when a travel agent accused a particular objector of advertising group-charter services to the public, though the bookings *his* company had taken had been, he said, "ethical." "I would like to say," this travel agent went on, "that [the objecting airline] has advertised his services to the general public ten times more than we have." His own firm had had a number of enquiries from people who had had "a rough time" with the company concerned, and who knew nothing about the Midlothian Travel Association. "The hundredth time I saw their advertisement," the agent went on, "I phoned them up, spoke to Mr — and asked if he could take a booking to Malaga. He said he could. When I asked him about the Midlothian Travel Association, he said: 'Oh, that's just something we operate and if you buy a ticket you become a member.' In actual fact," this speaker concluded, " he is diverting traffic from us." There was laughter in court.

The chairman asked the "accused" whether he would like to answer. Rather wanly the airline representative concerned said: "This only serves to emphasize our difficulties in trying to sell the service we have pioneered." He was further questioned by the Board about the validity of the allegations. Shortly after that he left the court room.

Somehow this little interlude was disquieting. Here we had an airline operator being accused, in public, of what amounted to sharp practice—accusations entirely unsupported by written or any kind of independent evidence. No doubt the allegations could have been so supported, but in principle it seemed quite wrong for a man to be pilloried in public without a shred of evidence except that supplied by the accuser.

The hearings were over by 3.50 p.m. The court room emptied, leaving the members of the Board to deliberate upon their verdicts.

What was the verdict on the Board? Perhaps it might be best expressed as: "On the whole they handled the thing quite well, but this was only a gentle preliminary training exercise. Their mettle will not really be tested until the Cunard Eagle v. BOAC North Atlantic case opens on April 18—and even then it will be a year or two before a considered verdict can be returned."

* * *

Yesterday, March 22, the Air Transport Licensing Board was due to hear BEA's case for new commodity rates for motor car parts on the Birmingham - Manchester route, to which British Railways were objecting; the corporation's case for an optional traffic stop at Birmingham on their Manchester - London - Milan route, to which Cunard Eagle and British United were objecting; and Channel Air Bridge's case for a Southend - Ostend service for day return excursion passengers only, to which Cunard Eagle and East Anglian were objecting.

Seated, l to r: Sir Friston How; Mr Cyril Harvey; Mr A. H. Wilson (chairman); Mr W. P. James. Standing, l to r: Mr D. H. Isaacs, assistant secretary; Mr J. E. Barnes, secretary; Prof R. G. D. Allen; Mr C. Bagnall; Mr E. Baldry

"Flight" photograph

SERVICE AVIATION

Air Force, Naval and Army Flying News

Queen Elizabeth the Queen Mother being greeted by Vice-Admiral Sir Charles Madden, C-in-C Plymouth Command, after stepping from the Whirlwind in which she landed on the flight deck of HMS "Ark Royal" at Devonport on March 14. The Queen Mother was arriving on her third visit to this carrier

Javelins for Far East

LAST operational squadron in the RAF equipped with Meteors is to become the first of the Far East Air Force to operate Javelins. No 60 Sqn (Sqn Ldr R. Knight), based at Tengah in Singapore, is to receive its first Javelin FAW.9 aircraft this summer. Crews are now returning to Britain for conversion courses.

With its new aircraft No 60 Sqn will continue to fulfil its primary role of night/all-weather defence of bases in the Malayan peninsula. It has completed over a year's service with a tropicalized version of the Meteor, the fighter which marked its introduction into service 16 years ago by taking considerable toll of the V.1 flying bombs. It had previously flown Venoms in the day-fighter/ground-attack role.

Teeth of the Navy

WHEN the commissioning ceremony of 700Z Flight was held at RNAS Lossiemouth recently the Flag Officer Flying Training, Rear Admiral F. H. E. Hopkins, described the Blackburn Buccaneer which the flight is to prove as representing "the teeth of the Navy." He added that it "will give the Navy far greater offensive potential than we've ever had before. Its performance and the equipment it carries allow it to penetrate to any area we may wish."

700Z Flight, Intensive Flying Trials Unit for the Buccaneer, is commanded by Lt Cdr A. J. Leahy. It is to have six aircraft, the first of which is due to arrive within the next few weeks. Derek Whitehead, the makers' chief test pilot, flew a Buccaneer up to Lossiemouth for the ceremony.

FAA "At Homes"

DATES when the public can see the Fleet Air Arm "at home" at RN Air Stations during this year have been given by the Admiralty as follows:—

HMS *Ariel*, Lee-on-Solent, Hants, June 15; Yeovilton, Somerset, June 17; Arbroath, Angus, June 24; Abbotsinch, Renfrewshire, July 8; Culdrose, Cornwall, July 15; Brawdy, Pembrokeshire, July 15; Lossiemouth, Morayshire, July 22. All these displays are on Saturdays with the exception of the Lee-on-Solent meeting, which is on a Thursday.

Director-General of Equipment

A NEW appointment as Director-General of Equipment at the Air Ministry has been announced for AVM Edgar Noel Lowe, CB, CBE, effective from March 15. He succeeds AVM Sir Geoffrey Worthington, KBE, CB, who

Cyril Rofe, MM, a member of the RAF Escaping Society, wearing the new RAF aircrew uniform for use at high altitudes. It has been designed and made by Hector Powe, and is the result of four years' experiment at the Institute of Aviation Medicine

is retiring from the Service. AVM Lowe has been Air Officer Commanding No 40 Group, Maintenance Command, since February 1958, and before that was Senior Air Staff Officer, No 41 Group. At the outbreak of World War II he went to France with the Advanced Air Striking Force. After the evacuation he served in the Air Ministry until 1947 on organization and equipment duties. From 1951-53 he was Director of Organization at the Air Ministry, after which he became Deputy Chief of Staff (Logistics) at SHAPE.

New Commandant for ROC

ON May 29 Air Cdre Cathcart Michael Wight-Boycott, CBE, DSO, a wartime night fighter pilot, is to become Commandant of the Royal Observer Corps, whose paramount responsibility today is reporting fall-out in the event of nuclear war. Air Cdre Wight-Boycott has been Director of Logistics (Forecasting and Planning) at the Air Ministry since September 1958, before which he was Director of Operational Requirements (A). In 1941 he joined No 219 Sqn and later commanded Nos 29 and 25 Sqns—all night fighter units. He won the DSO in January 1943 for destroying four enemy aircraft during a night raid on London, and a bar to it in 1944, in which year he was credited with the destruction of three more aircraft and two flying bombs.

IN BRIEF

RAF Felixstowe, Suffolk, is to close down at the end of this year.

Correct date of the RAF Anniversary Concert, referred to in these columns last week, is April 26.

This year's annual dinner of the RAF Flying College Association is being held on Wednesday, June 7, at RAF Manby. Members are asked to make a note of the date. Further details will be circulated to them in due course.

On their own initiative, four student pilots from No 6 FTS, Ternhill, with two instructors, have been spending two weeks making a social and economic survey of the Moroccan town of Agadir, which was struck by an earthquake last year. The party was led by Flt Lt John Pollard.

Senator H. W. Wade, Australian Minister for Air, announced recently that the RAAF is to buy additional equipment for the detection of radio-active conditions. Training courses had already begun for senior officers in defence against nuclear, biological and chemical warfare.

No 11 Sqn are compiling a photographic history of their unit and will be glad to have any photographs—dated where possible—considered to be of interest. Pictures will be treated with the utmost care. They should be addressed to Flt Lt T. J. Betterton, 11 Sqn, Royal Air Force, Geilenkirchen, BFPO 40.

The eighth annual dinner of the Bristol University Air Squadron is being held at RAF Hullavington on Friday, May 5, at 7.30 for 8 p.m. Members and ex-members are invited to attend and should contact the Mess Secretary, Officers' Mess, Bristol University Air Squadron, 12 Whiteladies Road, Bristol 8.

The 39th all-ranks reunion of the RN Seaplane Bases, Port Said and Alexandria, Old Comrades' Association, embodying former members of No 269 (GR) Sqn, is being held at the Chicken Inn Restaurant, Wilton Road, Victoria, London SW1, on Saturday, April 29, at 6 p.m. The hon secretary is W. C. Shilling, "Selgrove," Kewferry Drive, Northwood, Middlesex.

Commandos from HMS "Bulwark" have been exercising west of Aden. A Whirlwind and Wessex are here seen supporting land operations of the Third Commando Brigade, Royal Marines, in a desert exercise

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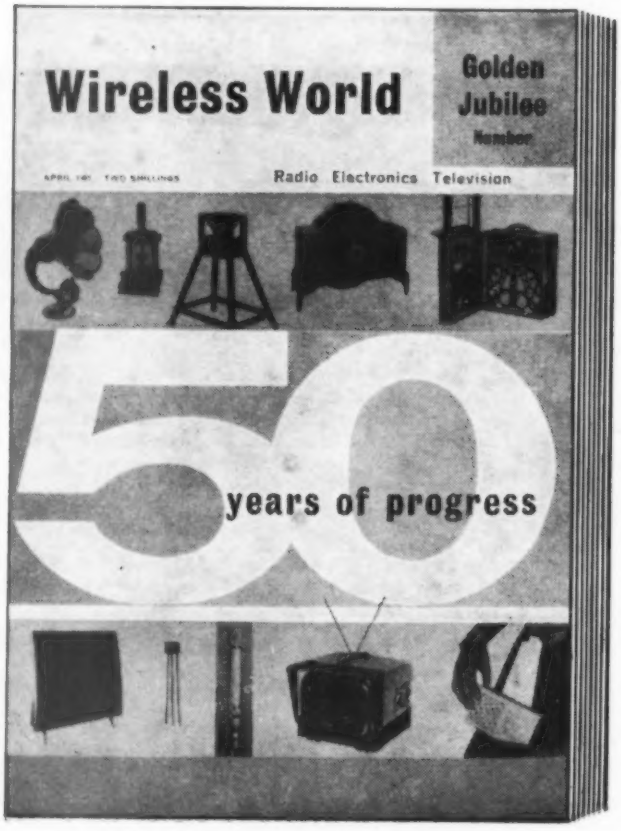

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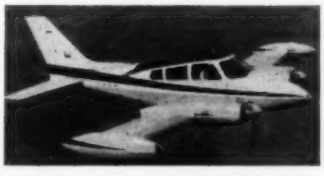

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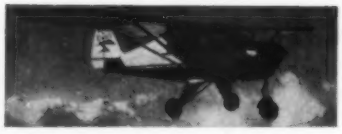

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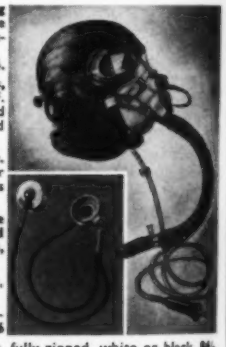

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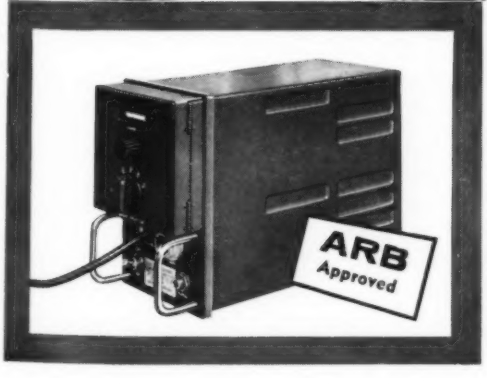

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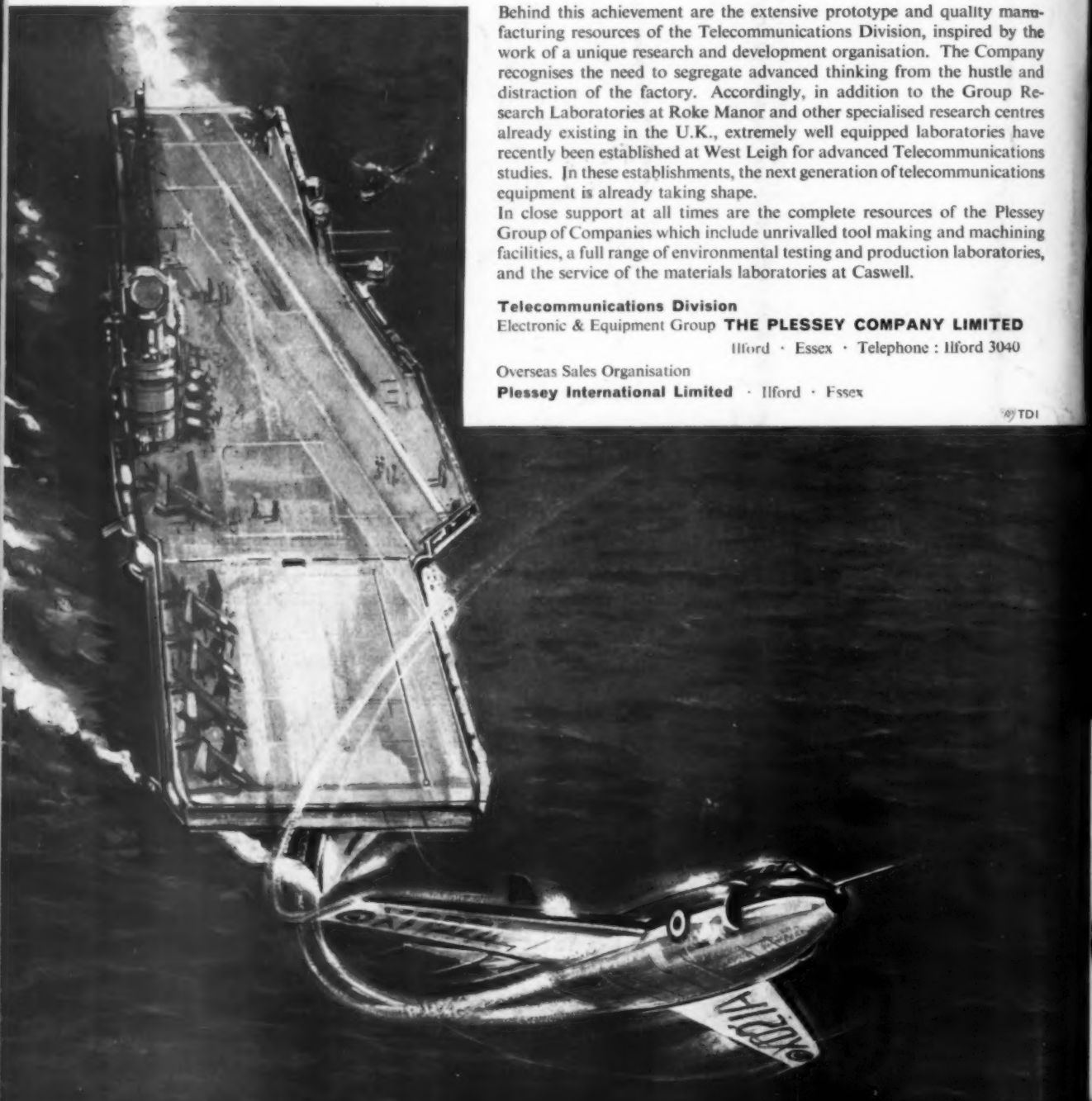

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